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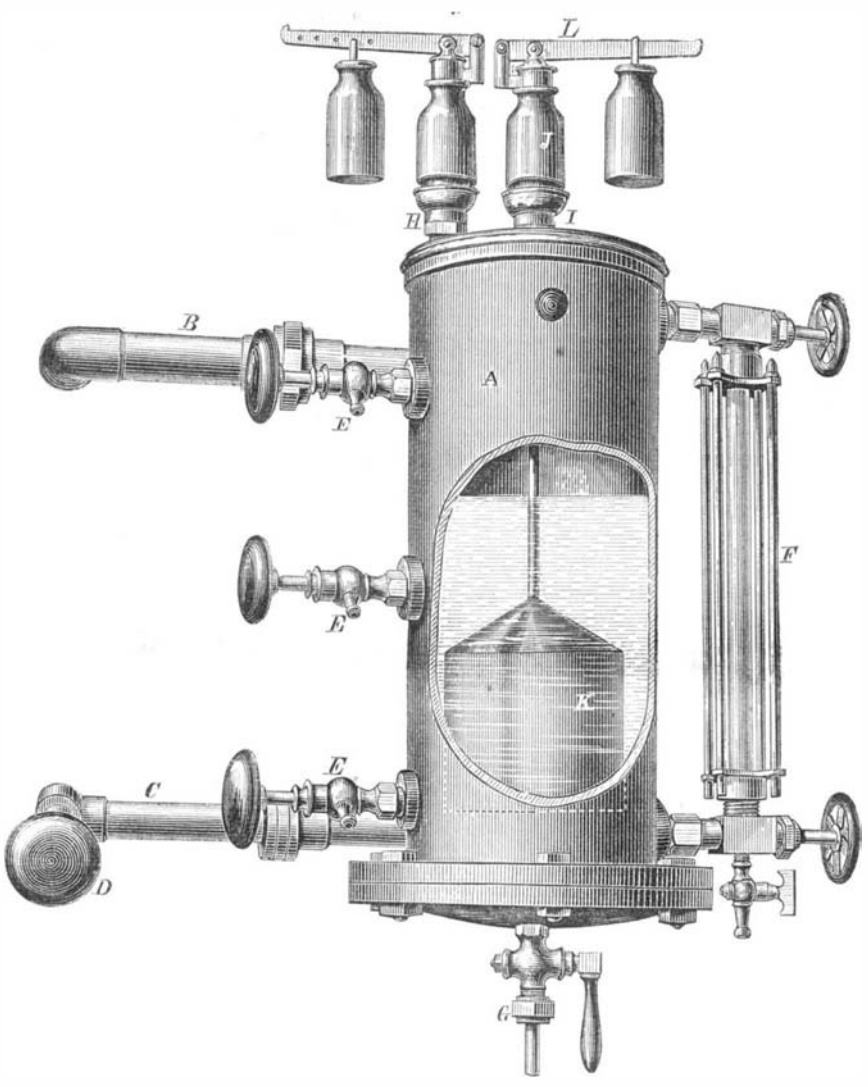
Improvement in Steam and Water Indicators.

Difficulties attend the use of safety valves, water indicators, try cocks, and alarms, as applied to steam boilers, owing to corrosion, clogging by sediment, and other causes not always readily detected. Every engineer knows that, ordinarily, eternal vigilance is the price of his safety and of those whose lives are under his care. Frequently this vigilance must be exercised by attention to several devices, not arranged together, although intended to operate in concert. The engravings present views of a patented indicator and alarm, which, we are satisfied from a close examination of the device and its working in actual practice, is well calculated to show the condition of the water and steam in all cases, and and may be made to give an alarm for either low water or high steam, or any inconvenient or dangerous condition of the contents of the boiler. The testimony of Messrs. Pratt, Whitney & Co., the well-known tool builders of Hartford, Conn., who have used one on their boiler for six months, and have just ordered another for a new boiler, is of the most favorable character, and ought to satisfy all who know the standing of that firm.



BERRYMAN'S STEAM AND WATER INDICATOR AND ALARM.

An upright cylinder, A, is attached to the head of the boiler by pipes, B and C; one of which, B, enters the boiler in the steam space, and the other below the water line. The lower pipe, C, has a cock, D, to prevent the accumulation of mud or sediment in the elbow. The cylinder, A, thus becomes a part of the boiler, and has the ordinary water and steam gage cocks, E, attached, and also the common glass indicator, F, for water, on the front. The use of the blow-off cock, G, at the bottom of the cylinder, will need no explanation to engineers.

Two valves are arranged in the upper part of the cylinder, one of which, H, opening upward, is raised by the excessive pressure of steam, and acts as a safety valve, while the other, I, opening downward, is lowered by a weight when either the pressure of the steam, or the level of the water falls below a given or determinate point. This valve, as well as the other, may have attached, as seen in the engravings, whistles, J, intended to sound an alarm. If not wanted, these whistles may be dispensed with. The steam safety valve, H, is governed in its pressure, as ordinary valves, by a lever and an adjustable weight, the fulcrum, however, that receives the end of the lever being seated on the guide of the valve spindle, so that it may be turned to any position, and the play of the valve is governed by the screw thread on the hollow guide. The stem of the valve, I, extends down through the center of the cylinder, and receives on its lower end a weight, K, either of hollow metal or disks of soapstone, or other suitable material. This valve opens downward, and like the other, its lever and fulcrum may be moved into any position most convenient.

The weight, K, is adjusted to the pressure of steam required and the hight of water. When the water is at the low water line, the weight, K, will open the valve and sound the alarm. As the water rises, the weight diminishes (being supported by the water), and closes the valve. If the pressure of steam is reduced, its force on the valve is correspondingly reduced, and an alarm is given, by the dropping of the valve, for low steam. It will alarm for high water on the same principle, as too much water in the boiler diminishes the steam pressure, and prevents the rapid generation of steam. The reliability of the indicator can be tested by pressing on the lever, L. The cone-like form of the weight, K, combined with the blow cock, G, insures perfect cleanliness in the cylinder, as all sediment must settle, and can be blown off through the cock. The steam pipe, B, is larger than the water pipe, C, which prevents the water from rising when the indicator alarms for low steam or high water. There are no springs, levers, or movable joints in the cylinder or chamber to become corroded, and no valves between the chamber and boiler; thus the chamber becomes virtually a portion of the boiler, and under no circumstances of lowness of water or foulness of boiler, can the indicator fail to represent the actual hight of water and condition of steam.

Patented through the Scientific American Patent Agency, July 28, 1868, by Robert Berryman, who may be addressed at No. 219 North Third st., Philadelphia, Pa., for the instrument, and for State or manufacturing rights; where, also, the indicator may be seen in operation.

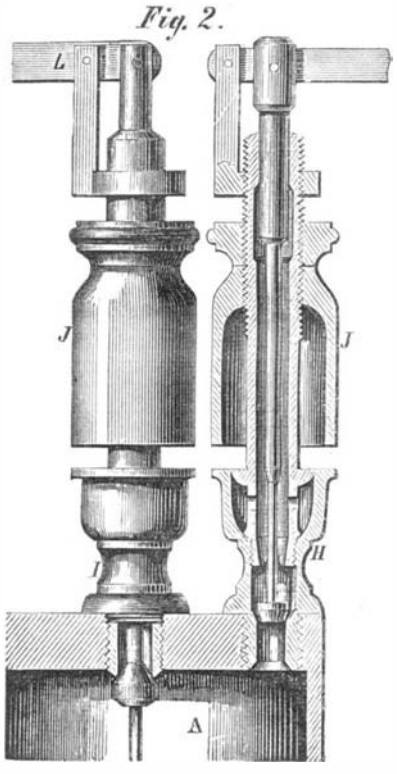
Concentrated Progress of the World.

Few phenomena are more remarkable, yet few have been less remarked, than the degree in which material civilization—the progress of mankind in all those contrivances which oil the wheels and promote the comfort of daily life—has been concentrated in the last half century. It is not too much to say that in these respects more has been done, richer and more prolific discoveries have been made, grander achievements have been realised, in the course of the fifty years of our own lifetime than in all the previous lifetime of the race, since states, nations, and politics such as history makes us acquainted with, have had their being. It is in the three momentous matters of light, locomotion, and communication that the progress effected in this generation contrasts most surprisingly with the aggregate of the progress effected in all generations put together since the earliest dawn of authentic history. The lamps and torches which illuminated Belshazzar's feast were probably just as brilliant, and framed out of nearly the same materials, as those which shone upon the splendid fêtes of Versailles when Maria Antoinette presided over them, or those of the Tuileries during the Imperial magnificence of the First Napoleon. Pine wood, oil, and perhaps wax, lighted the banquet halls of the wealthiest nobles, alike in the eighteenth century before Christ and in the eighteenth century after Christ. There was little difference, except in finish of workmanship and elegance of design—little, if any advance, we mean, in the illuminating power, or in the source whence that power was drawn—between the lamps used in the days of the Pyramids, the days of the Coliseum, and the days of Kensington Palace. Fifty years ago, that is, we burnt the same articles, and got about the same amount of light from them, as we did five thousand years ago. Now, we use gas of which each burner is equal to fifteen or twenty candles; and when we wish for more can have recourse to the electric light or analogous inventions, which are fifty-fold more brilliant and far-reaching than even the best gas.

The streets of cities, which from the days of Pharaoh to those of Voltaire were dim and gloomy, even where not wholly unlighted, now blaze everywhere (except in London with something of the brilliancy of moonlight. In a word, all the advance that has been made in these respects has been made since many of us were children. We remember light as it was in the days of Solomon; we see it as Drummond and Faraday have made it.

The same thing may be said of locomotion. Nimrod and Noah traveled just in the same way, and just at the same rate, as Thomas Assheton Smith and Mr. Coke of Norfolk. The chariots of the Olympic Games went just as fast as the chariots that conveyed our nobles to the Derby, "in our hot youth, when George the Third was King." When Abraham wanted to send a message to Lot he despatched a man on horseback, who galloped twelve miles an hour. When our fathers wanted to send a message to their nephews, they could do no better and go no quicker. When we were young, if we wished to travel from London to Edinburgh, we thought ourselves lucky if we could average eight miles an hour—just as Robert Bruce might have done. Now, in our old age, we feel ourselves aggrieved if we do not average forty miles.

Fig. 2.



Everything that has been done in this line since the world began—everything, perhaps, that the capacities of matter and the conditions of the human frame will ever allow to be done—has been done since we were boys. The same at sea.

Probably, when the wind was favorable, Ulysses, who was a bold and skillful navigator, sailed as fast as a Dutch merchantman of the year 1800, nearly as fast at times as an American yacht or clipper of our fathers' day. Now, we steam twelve and fifteen miles an hour with wonderful regularity, whether wind and tide be favorable or not; nor is it likely that we shall ever be able to go much faster. But the progress in the means of communication is the most remarkable of all. In this respect Mr. Pitt was no better off than Pericles or Agamemnon. If Ruth had wished to write to Naomi, or David to send a word of love to Jonathan when he was a hundred miles away, they could not possibly have done it under twelve hours. Nor could we to our friends 30 years ago. In 1868 the humblest citizen of Great Britain can send such a message, not a hundred miles, but a thousand, in twelve minutes.—*Spectator*.

Death of the German Chemist Schonbein.

The telegraph announces the death of another eminent philosopher, whose labors have conduced greatly to the progress of science during the last half century. Christian Friedrick Schonbein was born in Würtemburg, Oct. 18, 1799. At the age of twenty-five he was a professor of chemistry at Reihau. After visiting and spending considerable time in France and England, for the purpose of completing his scientific education, he commenced a brilliant career in the university of Basel. His first experiments in this celebrated institution, led to important voltaic and electro-chemical investigations, which resulted in the demonstration of important principles. In 1839, his attention was attracted to certain peculiarities in the chemical action of oxygen, and its existence in the allotropic condition to which the name of ozone has been given, was made by him the same year. In 1845 he invented gun-cotton. The later portions of his life have been devoted to experiments with oxygen, and the production of numerous works upon abstruse physical and scientific subjects.

THE value of the SCIENTIFIC AMERICAN as an advertising medium can scarcely be over-estimated.

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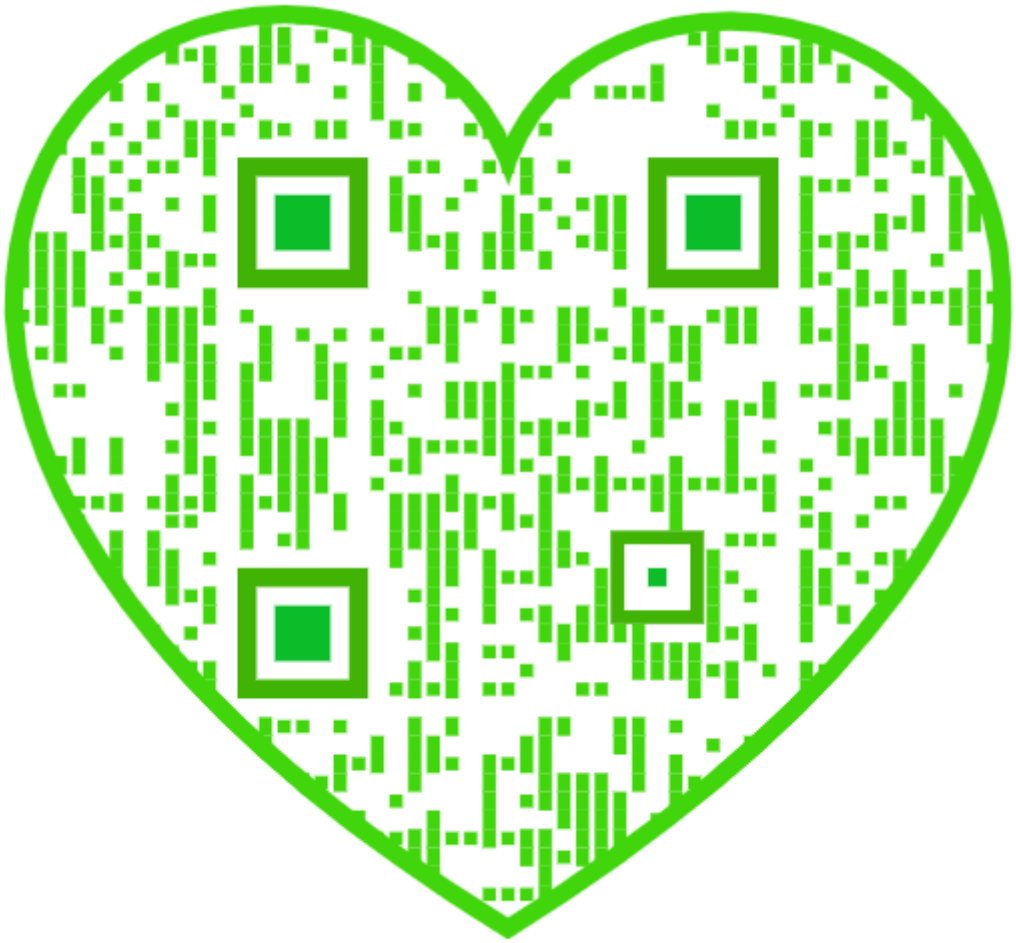

PRACTICAL HOROLOGY IN AMERICA.

The American watchmaker, so-called, is not usually a manufacturer of watches, or even parts of watches, but simply an artist whose business it is to repair and keep watches in order. He is generally a man of rare mechanical genius, capable of turning his hand to almost anything, hence he is not unfrequently, especially in the country, also a clockmaker—in the same sense—a jeweler, and a repairer of musical instruments. In short, the good watchmaker is almost invariably, if he is disposed to let himself out, a Jack-of-all-trades. He must possess a degree of ingenuity sufficient to qualify him for almost any mechanical performance without the benefit of a previous apprenticeship, or he cannot be a successful watchmaker, for it is a business in which there is no regular routine, as in other trades. Any industrious person, though endowed with nothing above an ordinary capacity, may, in obedience to a long series of instructions, combined with practice, make a master carpenter, blacksmith or wheelwright of himself, but not a watchmaker. The watchmaker, whose skill is to render him deserving of the appellation, must be blessed with a natural gift above the generality. Like the painter, the sculptor or the poet, he must be born to the calling. Not only must he be what is termed a natural mechanic, but a philosopher as well, possessed of a good reasoning power of his own; for instances are sure to occur, and often, in which he will be called upon to ferret out causes and effects never met with or thought of by his instructions.

I throw in these hints, not with a view to the discouragement of any, but in the hope that they may be of benefit to some who are thinking of becoming watchmakers. If the true element is in them, it has given evidence of the fact, and they may go ahead with confidence of success; if not, they had better abandon the idea at once and turn attention to something else; bearing in mind that all were not made for the same vocation, and that he who would not make a useful watchmaker, might more than succeed at some other calling. True, a person might get along at the business without these extra qualifications named, but there would be no chances for him to excel, and unless one could be an excellent watchmaker, he had far better be no watchmaker at all. Unfortunately for us and for them, there are already too many second and third class workmen of the kind in America.

To within a few years back, horology was at a low ebb in the United States. It is beginning to look up now, however, with excellent prospects for a glorious future. I am of the opinion that the day is not far distant when she will make not only all her own time-pieces, but will furnish a very large proportion of those used in other parts of the world. This conclusion I base upon what she has done and is doing already. It is truly astonishing when we take into consideration the fact that the business was a stranger to her shores up to the beginning of the nineteenth century.

The first attempt at producing machines on American soil for the measurement of time was made by Eli Terry, of Plymouth Hollow, Conn., A. D. 1800, in the manufacture of the old-fashioned wooden clocks. He went into the business on an exceedingly small scale at first, doing, I think, all the work himself, and acting as his own salesman and traveling agent. He would finish two or three clocks, it is said, and swinging them upon the back of a horse, would strike out into the country and peddle till the last one was sold; then, but not till then, he would return to his home and engage in the manufacture of a new cargo.

The excellence of Mr. Terry's clocks, and their cheapness when compared to that of the imported article, soon caused his business to grow until the erection of a large establishment became necessary. This continued in successful operation until Mr. Terry's death, a few years ago.

When it became known that the Plymouth Hollow clock factory was a paying institution, other establishments sprung up to rival it. Great improvements were made both in the materials worked and the manner of working them. Indeed, so rapid was the progress made that only a few brief years passed ere America was famed abroad for producing the best clocks in the world, and large exportations were constantly being made.

An establishment for the manufacture of watches went into operation at Worcester, Mass., in 1812, but soon failed. In 1830, another was started at Hartford, Conn., but after turning out near one thousand watches, it too went down, and the hope of competing successfully with English work seemed to die out for the present.

In 1850, Mr. A. L. Dennison, of Maine, suggested the idea of manufacturing a watch entire in one establishment, by properly constructed machinery—a thing not yet thought of in Europe. Others took with the idea and soon joined him in the erection of a manufactory at Roxbury, Mass.

The plan worked to the satisfaction of all concerned, but the site was found to be unsuitable on account of the dust; consequently, in 1854, the concern was removed to Waltham, in the same State, where it is still (1868) in successful operation, turning out the celebrated "American Watches" in large numbers. It is known as "The American Watch Company of Waltham, Mass.," and its watches have acquired a good reputation.

A second watch manufactory on Mr. Dennison's plan, was established at Nashua, New Hampshire; but want of capital soon caused it to fail, and the American Watch Company bought its machinery. A third is now in operation at Elgin, Illinois, near Chicago, under style of "The National Watch Company." It was established in 1867, and its productions have a very excellent reputation.—*Watchmaker and Jeweler.*

THE sugar refineries of Philadelphia annually refine 190,000,000 lbs. of raw sugar per annum, worth at present prices $22,000,000.

AIDE MEMOIRE FOR SILICIOUS FORMULAE.

The above is the title of a paper contributed to the *Chemical News*, by the Rev. B. W. Gibsone, M. A. It is an application of mnemonics to the instruction of pupils in mineralogy and shows such an amount of originality that, notwithstanding the technical nature of the subject, it will be read with interest by those who know nothing of mineralogy, as well as by those who are experts. The latter, by its perusal, will be enabled to see how much unnecessary labor they have undergone, while the former, now that all the difficulties of the subject are removed, may be expected to immediately become intensely interested in the science.

Mr. Gibsone adopts as the basis of this beautiful system, the formula

$$p\mathrm{MO},q\mathrm{SiO_2} + r\mathrm{R_2O_3},s\mathrm{SiO_2} + t\mathrm{H_2O}.$$

in which the italics represent the numbers which indicate the proportions in which the substances represented by the Roman letters are found combined in the different silicious minerals. The substitution of the values of the italics, in the formulae expressing the composition of these substances, has been such a severe strain upon the minds of the author's pupils that he has been led to lighten their labors by the following ingenious method, which has given them (or him) such extreme satisfaction, that he has bestowed it upon the public through the pages of the *Chemical News*. As a true citizen of the United States, we feel sorely vexed that this discovery should have been made in England, and we call our school teachers to task for their stupidity. We have looked the late edition of Prof. Dana's Mineralogy through and through, but we find not a syllable that would lead us to suppose that he had any knowledge of this system, and we therefore feel called upon to retract all that we said in its favor in our recent notice of that work. But we hasten to lay this system, in all its fair proportions, before the (it must be by this time) curious reader. Mr. Gibsone says that "abstract numbers may be represented by consonant letters, and these letters may then be grouped by aid of vowels into intelligible words [Query. Are intelligible words sufficient to constitute an intelligible system?] having some relation, obvious or fanciful, to their original.

Thus adopting Howlett's system of *memoria technica*, and calling

s or x..... 0	d or v..... 6
q or t..... 1	c or k..... 7
h or n..... 2	b or w..... 8
g or m..... 3	p or f..... 9
r or z..... 4	y.....10
j or l..... 5	

such a long sequence of figures as 59221 might be represented by the word *elephant*, or 92(10)75 by *physical*, the semi-consonant, y, being combined with the following consonant to form the symbol of any number from 10 to 19.

The following extracts will serve to show what elephantine efforts are saved the fortunate pupils of the Rev. B. W. Gibsone, by the use of this system, which may be said to have converted the usual mental labor of acquisition into the physical labor of shouting in concert, with head thrown back and eyes closed, such exercises as

ALUMINOUS SILICATES.

German calls Garnet Idocrase;
Man makes Staurolite; *grain* of clay's
(*O tœdium di!*) débris Felspar;
Rare gaze to duped eyes Micas are;
Heat Topaz and its tint will *fade;*
Of *murder* Scapolite 's afraid
And gLucy Beryl sweet *good maid,*
Trapezal Leucite brings *them aid,*
But *graver* Epidote can't come;
Pol'd Tourmaline is *set in gum.*

HYDRATED ALUMINOUS SILICATES.

Tune maiden Analcime thy feeble lyre,
While Mesotype searches *the mart* for a buyer.
Quid mi Dave! see Stilbite's lustrous fire;
The zeolyte Prehnite *ne'er meant* to proclaim
Them dead to the fame of frail Chabazie's shame,
Nor that green-slate became for Chlorite *our home name.*

MAGNESIAN SILICATES.

Hail Talc, and in Magnesian group
Gib Steatite a part,
Never smoke Meerschaum, or the croup
Will *hurt* Picrosmine's *heart.*

Proud Augite, Pyroxene, Hypersthene *queen*
Has three titles, but Chrysolite Olivine *none,*
Substitutive ferruginous Serpentine *green,*
And tough Amphibole, Hornblende will finish *lay one.*

Splendid exercises for public examinations, and so indicative of superior knowledge upon the part of any one who could by any means remember or interpret their meaning, that we suggest the appointment of a committee of the most eminent educators in the United States to wait on Mr. Gibsone with a request that he should visit America as soon as possible, to give a series of popular lectures, upon the now simplified science of mineralogy, to be interspersed with personal recitations of other specimens of humorous and instructive scientific poetry of which he doubtless has plenty in reserve. Or, if he prefers to sing them, they would be all the more attractive. Peradventure some composer might be found who could set the stanzas to appropriate music.

The Telegraph in Philadelphia.

The Western Union Telegraph Company, at the southeast corner of Third and Chestnut streets, is one of the great institutions in the way of transmitting and receiving information to nearly every town and city in the United States, to Canada, England, Egypt, and even China. To accommodate this vast business, 123 wires enter the building, and are connected with two baterries; one of 65 cups, with a positive pole, which furnishes battery power to 28 different wires; the other with 45 cups and a negative pole, furnishes power to 11 different wires. Of the 123 wires, 49 are known as through wires, sending messages direct to certain given points. Twelve are for way stations; 26 are loop wires for use in connection with branch offices; 11 wires for city office, and 25 to be kept for contingencies. These lines connect with 49 instruments in the fifth story (all messages received by these are given to the operator by sound instead of on paper, as originally invented) and three are connected with printing machines located on the first floor.

The wires lead out of the office as follows: 24 to New York; 15 to Washington; 10 to Pittsburg; 1 to Cape May; 1 to Salem, N. J.; 2 to Scranton, by way of Trenton and Easton; 1 to Atlantic City; 1 to Long Branch, and 1 to Williamsport.

The force required to carry on the business of the office is thus summed up; 39 operators of Morse instruments, 3 of the printing; 16 clerks; 8 office boys; 30 messengers; 1 janitor; 3 for turning printing machine; 1 battery keeper; 3 repairers; 6 branch office clerks; 34 clerks on city line; 1 manager; 1 office clerk; 1 night clerk: 1 cashier; also on city line, 37 operators; 2 clerks; 1 superintendent, and 21 messengers.

The wires of the Philadelphia office have recently been very skillfully arranged by Mr. M. V. B. Buell, Assistant Superintendent. Few men in the service know better how to do it.—*Journal of the Telegraph.*

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Cotton Planting—New Implements Wanted.

MESSRS EDITORS:—The continuous rains from July 1st, to August 10th, have risked the larger portion of the cotton crop; and this, added to the extreme scarcity of money, has, for the last sixty days, suspended all business except that connected with supply of food. This has caused us to delay answering your letter, and we now find that the demand for gin stands, only arising in cases of necessity, has been supplied from second-hand stands, which the diminution in number of acres cultivated has left very abundant. The weather has cleared off, and for two weeks has been extremely favorable for cotton. Picking has commenced under favorable auspices, the price is good, and it is rapidly coming into market. The present crop, yielding very large profits to the grower, will insure the capital for next year, and the cultivation of every acre of ground for which labor can be procured. This will cause a demand for labor-saving agricultural implements, and the introduction of them will yield profits. These implements will first be used on our level lands, now badly drained; but the soil is so pliable as to be easily cultivated. We want a buggy plow, cultivating seven feet, having the water furrow eight inches below the ridge, and a ridge on each side; the ridges upon which the cotton is planted never being broken.

The cotton is brought to a stand in early spring by a sweep skimming the surface, and cutting the tender grass, leaving the young cotton in a margin on top of the ridges three inches wide, the young grass being cut off just below the surface. The cultivation is in drills, never in squares; and after a stand is obtained, the entire culture is by throwing fresh earth to the cotton, the ridges never being broken; the main sustenance to the plant being from the tap root, and no fruit is produced until this root reaches the hard or unbroken soil. An agricultural implement, with seat for driver, would enable one man and two mules to do the work for which six men and as many mules are now required, and this with sweep for skimming the surface, and cutting the young grass, are all the implements required. The sweeps are usually made in shape of a V, the angle in front, and with cutting edges. The young cotton plant is very delicate until high enough to have dirt thrown upon it, after which it can be cultivated altogether by mule power. The use of improved agricultural implements, on the level lands of the Mississippi and its tributaries, by negro men and boys, would add enormously to its production; the gathering being done at so much per pound, the women and children then assisting, and all receiving cash for their labor.

Vicksburg, Miss. A. M. PAXTON & Co.

The Philosophy of the Velocipede.

MESSRS. EDITORS:—The velocipede is attracting considerable attention in the East, not only from the surprising feats which it is made to perform, but also the ease and rapidity with which the operator is enabled to traverse short distances, compared with the time and labor necessary to travel the same by walking.

That a carriage or velocipede, with but two wheels, the one following the track of the other, and propelled by the feet of the rider (by simple crank motions), should maintain an upright position is, to the superficial observer, one of the most surprising feats of practical mechanics.

When, however, we consider the law of moving bodies, and their tendency to continue in the direction of the impulse that set them in motion, and apply it to the velocipede, we have the philosophy of the whole problem. The ease of the operator to maintain his equilibrium while the machine is in motion, or rather the tendency of the velocipede to be self-sustaining, after a certain velocity is attained, is the same as that which sustains, against the law of gravity, the spinning top, the revolving wheel, and the rolling hoop. In experimenting upon this subject, we observe that a wheel of given dimensions will maintain its equilibrium while revolving down a slightly inclined plane, with no greater velocity than from five to six miles per hour; and when its motion becomes sufficiently retarded to incline to either side, that the wheel does not immediately drop, as in the instance of one set upright and not in motion; but as it is more retarded, it describes a spiral curve of decreasing form, and, finally, comes to the ground.

Now, from the very nature of this curve being in the di-

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rection, or on the side of the falling wheel, it has a tendency to raise the wheel to an upright position; and were its motion, while in the act of falling, a uniform and not a retarding one, it is evident that, like the velocipede, it would regain its balance, and with no interfering obstacle, would again move off in a direct line.

The rule that governs the motions of the simple wheel is applicable to the more complex velocipede, with this difference, that, in the latter, the propelling force is continuously applied, and for this cause, that the rider could upset his vehicle while moving in a straight line, and with a certain velocity, is impracticable.

Hence, as we understand the philosophy of the velocipede, and its mechanical simplicity, we infer the practical utility of the same, and wonder why it was not brought into use sooner. H. O.

Center of Gravity of a Revolving Wheel.

MESSRS. EDITORS:—The assertion that in a vertical revolving wheel the center of gravity shifts when in motion is not new. It was suggested here some ten years ago, at the time that many inquiring minds tried to explain the action of the rotascope or gyroscope, when this little old apparatus became, in a new shape, generally known to the public. Some asserted that the weight of a wheel diminished when revolving, others that its center of gravity was moved upward, or that it was moved forward from the axis; every assertion being a ground less hypothesis by which the explanation of the rotascope was supposed to be made easy. At that time, I demonstrated by actual experiment, before the Mechanics' Institute, of New York (now, alas, defunct), the falsity of each of these assertions. The last one (the one in question, page 178) was disproved by attaching to each extremity of a balance beam an easily movable vertical wheel, rotating in the same plane as the beam, when, by putting this wheel in motion, the center of gravity had been shifted from the axis of the balance or towards it, it was supposed that the equilibrium established beforehand would be destroyed. This, however, was never the case; when there was equilibrium before the rotation, it remained so during the rotation of the wheel or wheels in any direction.

I know some arguments may be opposed against this form of the experiment, which it would be unprofitable to discuss here. The only point I wish to prove is the antiquity of the hypothesis of which you have so well explained the absurdity, on page 179. P. H. VAN DER WEYDE, M. D.

New York city.

White Opaque Glue.

MESSRS. EDITORS:—Mr. Jones states, in regard to mixing Paris white with glue, that he saw by the microscope the white enclosed in separate cells formed by the glue, and that he could see each grain. From this it is evident, first, that he did not mix the white thoroughly, second, that he used too much white altogether, and, third, that his white was not pure enough, as real Paris white will not show "grains" under the microscope. I will add for his information that the best white Cooper glue, rightly so celebrated for its superior sticking qualities, is all made white and opaque by an admixture of Paris white, but of so fine a quality and so well incorporated that no microscope will show any grain or any cell or sac separating the glue.

In conclusion, I will say that many practical men assert that the sticking qualities of glue *are* really improved by a limited quantity of very fine Paris white well incorporated; but whatever may be the case, the valuable information I did give on this subject, page 83, was brought out by the blundering of some correspondents; one of whom recommended, for whitening the glue, gritty bone ashes, the other recommended chemicals which destroy the glue entirely. I therefore analyzed a sample of white opaque glue of excellent sticking quality, examined it with the microscope, etc., and gave the result gratuitously to the readers of the SCIENTIFIC AMERICAN, many of whom appeared anxious to know how white opaque glue was produced.

P. H. VAN DER WEYDE, M. D.

New York city.

Unreliabilty of the Glass Gage for Steam Boilers.

MESSRS. EDITORS:—Being a reader of your valuable paper, I observed an invitation to the hard-fisted sons of toil to be more communicative, and that their compliance would be pleasing. As this is so, I wish to say a few words on water gages for steam boilers, particularly those having a glass indicator set in front of the boiler with a steam communication at the top and a water communication at the bottom of the chamber. I think they are not to be implicitly trusted.

A short time ago the engine and boiler which I run, were inspected and tested by an expert employed by the insurance companies, and he stated that there was no scale for sediment in the boiler; yet two days after the glass indicator showed water to the hight of three gages, when, on trying the cocks, the second one barely gave indications of water, and it was only by letting it remain open and permitting the steam to escape that I could draw water. The communication at the top of the glass had become partially clogged. I believe that no matter how low the lower gage cock is placed, if the steam connection with the indicator is partially closed or clogged the pressure of the steam will raise the water in the indicator tube above the level of that in the boiler.

Sheboygan, Wis. J. S.

[The laws of hydrostatics show that a small column of a fluid will balance a large column. The level of water shown in the glass indicator tube is that of the level in the boiler if the proper communication is maintained between the tube and boiler. Our correspondent's experience does not prove the unreliability of glass indicators, but shows the necessity of care in keeping them clean and the passages open.—EDS.

A Word for the Old Fashioned Trip Hammer.

MESSRS. EDITORS:—Having been for many years a constant reader of your valuable paper, which is always open to both sides of the question, I wish to speak in behalf of the old fashioned trip hammer. On page 161, current volume, you speak slightingly of the trip hammer, that is, of the old style with its wooden handle or helve. Hundreds of mechanics believe it to oe the best hammer in use. Consider the usage a bammer gets, the necessity of "striking while the iron is hot," and the advantage of rapid blows retaining if not increasing the heat, and you will see that the old style hammer is justly preferred in nearly all steel and tool shops. It is not apt to get out of repair, can be run rapidly, does not rebound, can be readily adjusted to draw tapers, is easily managed, and will stand long the hard usage in plating or drawing thin steel which no cast iron hammer would bear.

The necessary movements to give a graduating blow only add unnecessary parts to be kept in order without giving in return any benefit to a good forger. It is nice to look at a hammer cracking a nut or drawing a shaft, but the peanut eaters do not employ a steam hammer when two stones will do the work. Would you?

The writer further states on the same page (161) that the ordinary trip does not strike a square blow except on a thin piece of work. Now, if the hammer comes down square on a thin so it will on a thick piece, if the dies are properly adjusted by being left slightly open toward the fulcrum; the hammer moves in the arc of a circle, hence the necessity of setting the die at an angle below the center.

Again, the trip does not fall by gravitation, as the writer asserts, but the weight of the blow is increased proportionably to the resistance necessary to compel the hammer to move up and down in the alternate spaces between the lifts or cams; the more force in lifting so is the blow heavier. A one hundred pound hammer lifted eight inches by cams and run four hundred blows per minute, strikes a blow of about a half tun weight. P. McC.

Newark, N. J.

[Our correspondent, whose practical suggestions, drawn from a long experience, have often enriched our columns, does not appear to have made out a very clear case for the superiority of the old fashioned trip hammer. We do *not* "see that the old style hammer is preferred in nearly all steel and tool shops," for quite a number we know have removed them and replaced them by direct stroke hammers because of the advantage of the latter in rapidity of blows and ease of manipulation. As to striking square blows equally on thin and thick work, our correspondent admits our statement by asserting that the dies on a trip should be "adjusted by being left slightly open toward the fulcrum." If so adjusted no square blow could be had on a thin piece of work except at the outer point of the dies, and the angle that would give a square blow on an inch square bar would not on one of two inches square; this is self-evident and requires no argument. He denies that the trip works only by gravitation and asserts that a "one hundred pound hammer lifted eight inches and run four hundred blows per minute strikes a blow of nearly half a tun weight." It is evident that unless the hammer has a spring, only its weight, plus the distance of the fall, *i.e.* gravitation, produces the force of the blow. In the case mentioned it is simply the force of one hundred pounds falling eight inches. What he means by the weight of the blow being increased proportionably to the resistance, etc," we are unable to comprehend.—EDS.

Planchette a Humbug.

MESSRS. EDITORS:—Having noticed your remarks some time ago with regard to "Planchette," I purchased one of the creatures, and I have it now in my possession some three weeks; and having myself, and some twenty or more of my friends, repeatedly tried it, we unanimously agree that it is a humbug. When two persons put their hands on it, it certainly runs about the paper (I should like to see two persons with nerves steady enough to keep it from running); but as for forming letters, that it will not do, unless one or both of the persons whose hands are on it scheme and help the instrument to form the letters.

In Messrs. Kirby's pamphlet they say: "Planchette is sometimes coy, suspicious, reluctant, will not work for the skeptical," etc. They are quite right, it will only work for those who make it work.

Probably, however, there are no spirits living in this cold country of ours.

Kingston, Canada. H. A. M.

ARCHBISHOP KENDRICK ON THE PLANCHETTE.—When we published our first article upon the "Planchette," we had not the least idea that we were engaged in anything very diabolical, but we begin to fear that we have "put our foot in it," especially as Archbishop Kendrick, of St. Louis, has instructed the clergy of his diocese to warn Catholics, that if they do not desist from the use of "Planchette," they will be excommunicated. The toy is pronounced a "diabolical invention."

TUMBLING BARREL.—In relation to the tumbling barrel which we illustrated on page 168, current volume, SCIENTIFIC AMERICAN, stating that we believed it had not been patented, Mr. J. S. Fifield, of Westerly, R. I., claims that he holds the patent for it under date of June 11, 1867. We can only say that we saw it in use, both as tumbling barrel and coal sifter, at least five years before that date in Hartford, Conn., and on that fact we based our statement.

How to Poison Children.

One naturally touches the point of his pen with great timidity at a reputation like that of the illustrious Liebig. But the learned professor, since his stay in Paris in attendance on the exhibition, has promulgated in the journals of science new food for children, which he declares is being fed with success to thousands of children in Germany; or, to use his own expression: "*A des petits tudesques par milliers.*" This food is a chemical compound intended to contain the component parts of human milk, and to be a substitute for it. To accomplish this object, that is to say, to furnish to new-born children, deprived for any reason of their natural food, a substitute, he went to work and reproduced a milk by chemistry, which, chemically speaking was correct, and which, he contends, children may take with perfect safety and advantage.

With such an authority as that of Liebig, therefore, the whole scientific world of Europe has been trying this new compound; for, to find a substitute for mother's milk, especially for the use of the foundling hospitals, is an immense desideratum. But here at Paris it was tried on but four children, and these four it killed—two in three days, and two in four days. The experiment was made at the Lying-in-Hospital of Dr. Depaul, professor of clinical obstetrics of the faculty of Paris, and the children selected were those abandoned by their mothers. The artificial milk quickly brought on bilious purging and prostration. Of course, Prof. Liebig declaims loudly against the fairness of the experiment; but Dr. Depaul is a competent judge, and the whole Academy of Medicine, after a fair report from the chemists in their body have decided not to take the responsibility of a further experimentation with so dangerous a compound. What is the use, the Academy judiciously says, since we have in our hands so excellent a substitute, and so nearly an analogous substance, in cow's milk with the addition of a little water and sugar? And upon this substance, which is so easily obtainable, the Academy has decided to rely for the feeding of the foundlings and all other children placed in their charge. Prof. Liebig has undoubtedly lost a point in this discussion.—*Paris Cor. Times.*

Electricity and the Sensitive Photographic Film.

M. Becquerel finds that chloride and bromide of silver deposited on plates of platinum, when acted upon by light, give rise to a strong current of positive electricity, which is just the reverse of the kind of current which would be afforded by the platinum plate alone under the same circumstances. Now the chloride and bromide of silver are actually decomposed by light—the former obviously so, the latter less visibly—yet the bromide indicates a current of even higher intensity than the former. The conclusion is, that a precisely similar action takes place when the light acts on the chloride and on the bromide of silver, viz, reduction to a subschloride and subbromide respectively. On applying this curious test to the iodide of silver, it was found that it likewise gave rise to a current of positive electricity under the influence of light of nearly as as high intensity as that afforded by the chloride. The inference clearly is that iodide of silver is reduced to a subiodide, just as the chloride is to a subchloride, and the bromide to its lower state of combination.

In following the various stages of the discussion of a vexed question, it is singular to notice the changes in the bearings of the numbers of facts presented from time to time. Until recently all the evidence seemed to be tending to support the purely mechanical theory of the formation of the latent image; latterly, the complexion of affairs has quite altered, and the evidence all tends in the direction of a distant chemical change as being the result of the action of light, the experiments of M. Becquerel, referred to above, forming a strong link in the chain. Will some ingenious experimentalist now step into the arena and propose a crucial test which shall decide this vexed question once for all?—*British Journal of Photography.*

Iron Experiments.

A simple illustration will serve to show two facts connected with iron:—The first is its elasticity, and the second the power exerted by the pressure of the hand of any person. Make a hoop of one inch square bar iron, about the size of the brim of a man's hat; let the inside of the hoop be made quite smooth and true. Such a hoop being examined, it would appear that the power even of a horse could in no way alter its shape or form, provided the strain be put to it fairly and equably. Now make a rod of iron of the thickness of a lead pencil, that shall exactly fit the diameter of the inside hoop so that, when placed in the hoop, it will not fall out unless the hoop be altered in shape. If, acting in a similar way, we took a child's wooden hoop, so that, when placed in the hoop, with a stick across it in the center, and then pressed it at the sides opposite to that of the cross stick, the hoop would assume an oval shape, and of course the cross stick would fall out. Just so does the iron hoop described act; when any one presses it the iron rod falls out, showing clearly the elasticity of the iron. The hoop will become oval shaped with a very little pressure, not greater than that which can be exerted by a young girl.—*Septimus Piesse.*

M. TOUMACHON, the photographer, recently performed a feat worth recording. Having ascended to the hight of nearly a thousand feet in the captive balloon at the Hippodrome, Paris, he succeeded in taking several photographic views, accurately representing the city from a birdseye view. The chief difficulty he encountered was the rotary motion of the balloon. His success shows the practicability of obtaining correct representations of the positions of military forces safely and rapidly.

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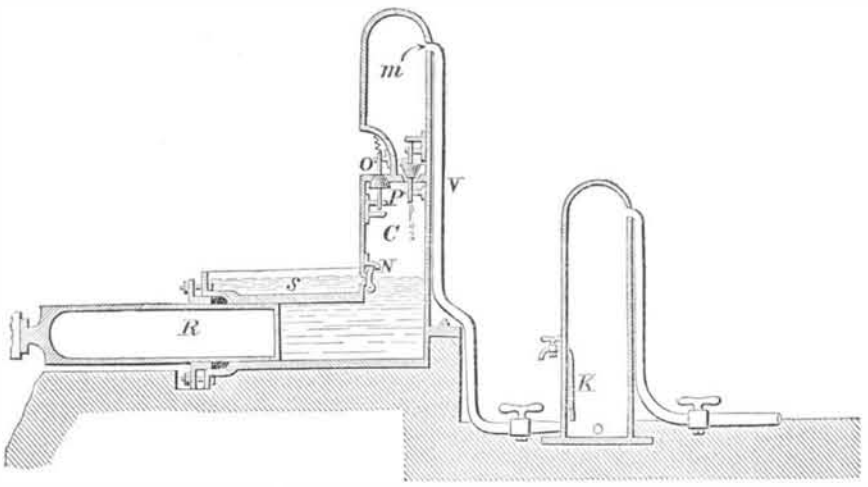
TRANSMISSION OF HYDRAULIC POWER FROM ITS SOURCE TO PROPEL MACHINERY AT A DISTANCE.

The *Bulletin Mensuel* contains an interesting discussion of the above subject by M. Leloup. We herewith give an abstract of the article, with an engraving of the apparatus by which M. Leloup proposes to accomplish the desired end.

M. Leloup says that there exist many difficulties in reaching and utilizing water power generated by the fall of water, situated at great distances from the centers of population, which, as such, are also manufacturing centers. The finding of any means to transmit, and to distribute in any desired amount, the power thus generated, so that the baker might knead his dough, the blacksmith forge his iron, by the aid thus afforded, is a desideratum. Combustible substances are now used to such an unprecedented extent as generators of mechanical power that the day must come when other means must be sought for, so that the fuels now in use can be economized for those industrial branches which cannot dispense with them. In order to do this we should turn our attention to the natural powers which exist on all parts of the globe, from the power creating high and low tides, to the power generated by the descent of the smallest brook. These powers are immense in comparison with all the power used in railway locomotion and in workshops. M. Leloup demonstrates that in the falls of French canals alone there exists a motive power of 336,320 horse-power.

The study of the question involves the solution of the great problem of the use of compressed air. Air has the property of indefinite expansion and contraction. It requires no process of preparation to enable it to contract and expand at regular intervals. It is the commonest of the elements and its cost is nothing.

He challenges the attention and the objections of practical men to the plan he proposes, by which the power of any fall of water can be transported to any distant place. The task would seem easily accomplished, by means of a force pump at the waterfall, a reservoir at a distance, and a tube connecting both. Tubes from this reservoir would lead the power to different establishments in the same way, as steam is distributed from a boiler to different steam hammers. What can be done with steam can also with more reason be done with compressed air, for the latter possesses the useful qualities of steam with none of the disadvantages resulting from condensation. In large forges the tubes which convey the steam to the hammers have to be clothed with linen or other non-conducting material, to prevent condensation and consequent loss of power. This inconvenience necessitates the multiplication of generators, to suit the multiplication of machines beyond a certain limit. This condensation is often so great as to absorb the greater part of the power of the steam at the boiler.



Air compressed in a solid and well closed leading tube loses none of its pressure. M. Leloup and M. Lucare made an experiment with a common lead gas-pipe, 5-16ths of an inch in diameter and 150 feet in length, coiled as gas-pipes usually come from the factory, applying a pressure of eighteen atmospheres, as indicated by a manometer; the instrument for three months indicated the same pressure. This result shows the entire reliability of tubes for conducting power.

The transmission of power by the use of pumps is attended with some difficulties. The high pressures required (15 to 18 atmospheres) exact great perfection in the mechanism of the apparatus. A pressure of 16 atmospheres is difficult to attain by a common air pump acting directly upon air. To obviate this difficulty water might be introduced into the pump, so that by a peculiar construction the piston would constantly be in contact with water instead of air. This combination changes the problem from the compression of gas, which is difficult, to the pressure upon water, which is much easier. The water in this system being constantly in contact with the piston, would first receive force, and it is known that the common force pump is sufficient for imparting 16 atmospheres pressure to water. The proposed apparatus is thus described:

It is composed of a cylinder bent at right angles so as to have one branch horizontal and the other vertical. The horizontal branch of the body of the pump is designed to receive the piston, R; the lower part, C, of the vertical branch to receive the injection; and the upper part, *m*, to receive the compressed air. This latter part communicates with the reservoir, K, by means of the tube, V. The apparatus is completed by a valve, P, called the evacuation valve; a valve, O, called an injection valve; a third valve, N, called the feed valve; a reservoir, S, called the feeding reservoir, and finally by the piston, R.

In the examination of the operation of this apparatus, we must remember that the only function of the water in the body of the pump is to insulate the moving pieces from the air. Let us now move the piston from the extreme inner position. By this movement the level of the water in C, will be brought down to a level with the lower end of the opening of the valve, N. The air will enter by the aspiration valve, O, and will occupy the vacuum caused by the displacement of the water in the body of the pump. The piston in returning to the inner position will at the same time elevate the level of the water in C, so as to reduce its capacity to nothing, consequently forcing the air up into the compressed air chamber, *m*, even raising a small amount of water also into *m*, which serves to pack the valve, P, during the next aspiration caused by the motion of the piston. The feed reservoir supplies through the valve, N, the amount of water used in packing the valve, P, and the losses commonly realized in pumps. The water after it has accumulated in *m*, flows through the pipe, V, into K, from which it is at proper intervals drawn off by a cock provided for that purpose. The connection of the compressed air chamber to the places where the power is to be utilized is made by tubes of metal or rubber, provided with valves to prevent the return flow of the air.

An American Invention In London.

The London *Standard* thus speaks of a life boat invented by a citizen of San Francisco:—

"Charles Gunner, a mechanic all the way from San Francisco, California, has provisionally registered a new boat which possesses some distinctive features, and a model of which we have had the opportunity of inspecting. The boat, intended by the inventor to be used for saving life at sea, is 36 feet in length, and of the same proportions as the boats of the Royal National Life Boat Institution. It is constructed to carry 40 passengers and a crew of nine men. Twenty passengers are intended to be accommodated in a cabin erected midships, and ten each in fore and aft cabins. The self-righting properties of the boat are efficiently secured by two air-tight cylinders placed midships on the gunwales, each six feet in length and three feet in hight, and a central circular cylinder of the same length and three feet in diameter, which is placed between the side cylinders and moves to either side of the boat on a self-acting pivot. As a coast life boat, the principal objections would be found in the air tight cylinders, which would be likely to be acted upon by the winds, to the detriment of its speedy progress through the waves; motive power would also be lost by the necessity of seating the oarsmen fore and aft. Ventilation of the cabins has not yet been perfected, but the inventor is sanguine of success on this point, without which, of course, it would possess no advantage over those at present in use. As a ship's life boat, however, there is no doubt that it would succeed admirably, its properties being such as to insure an effective launch under any circumstances and to enable it to live in any sea. The cabin could, in such case, be used for provisions."

ICE MACHINES.

Ice is not only a luxury in tropical climes or hot seasons which is beginning to be more and more appreciated, but the advance of civilization has made it a necesssity for many industrial pursuits as well as for medical purposes. Taking then into consideration the difficulties incidentally experienced in gathering, storing, and transporting this substance, sometimes for thousands of miles, it is not to be wondered at, that attempts have been made, several years since, to make a practical application on a large scale, of the beautiful lecture-room experiments of making ice with the so-called freezing mixtures, with the reaction of previous heat, or with the air-pump. There are consequently three kinds of ice-machines; first, those acting by the cooling effect of certain chemical mixtures; secondly, those acting by the previous application of heat; and, thirdly, those by which the freezing is produced by the cooling effect of evaporation in a vacuum made by an air-pump. The first kind we may call chemical machines; the second, caloric ice-machines; and the third, mechanical ice-machines.

I. CHEMICAL ICE-MACHINES.

Chemical combinations often manifest, as a secondary result, a great change in temperature, sometimes a raise or heating, sometimes a descent or cooling of the resultant product. Everybody knows the enormous heating attending the combination of quicklime and water into hydrate of lime, or of sulphuric acid and water. The mixture of lime with sulphuric acid and water produces a red heat, and of sulphuric acid, nitric acid, and oil of turpentine produces even ignition. The same is the case with sulphuric acid and chlorate of potash; and this last peculiar property had been used for making lucifer matches, before the friction match was invented.

In other chemical combinations, cold is often produced. This is generally the case when the product of the mixture is liquid; on the contrary, when no liquefaction takes place, heat is the result. An intense cold is obtained when salt is mixed with snow or pounded ice; in this case, however, it is simply the strong tendency which salt possesses to dissolve in water, which forces, as it were, the ice to liquefy in order to procure water to the salt. If we force a solid to liquefy, or melt without giving it the heat necessary as latent heat for this liquefaction, it will take this heat from the sensible heat, which will then diminish, as it will become latent in the liquid; the sensible heat being the only heat the thermometer indicates. A similar effect is produced when dissolving other salts in water or any other liquid; the descent of temperature being very different according to the nature of the substances.

Thus, five parts of sal ammoniac and five parts nitrate of potassa dissolved in sixteen parts of cool water will cause the temperature to descend about 20° Fah. Nine parts of phosphate of soda dissolved into four parts diluted nitric acid, will cause a descent of temperature of 50°. Six pounds of sulphate of soda gradually dissolved in five pounds of hydrochloric acid, will cause such a descent of temperature that it will freeze from five to six pounds of water in the course of one hour. This ice dissolved in alcohol will cause the temperature again to descend more than 50°. The most remarkable mixture of this kind, discovered by Berzelius, and producing the most intense cold, is the following:

Two or three pounds of chloride of lime is heated until it forms a porous mass, and is powdered and passed through a sieve, by which operation it absorbs just enough moisture as is necessary to cause it quickly to dissolve in water. It is then mixed with half its amount of snow, in a wooden vessel placed in a mixture of snow and salt. In the interior of this cooling mixture, mercury or ether may be frozen when introduced in a platinum crucible or glass ball.

When this powdered chloride of lime is dissolved in half or two-thirds its amount of cold water, it will easily freeze water when introduced into the mixture in a proper vessel, and this may perhaps finally be found a cheaper freezing mixture than any of the common ones now in use, as by simple evaporation the original salt may be regained.

Lately a small machine has been introduced to the trade, similar to a large cream freezer, in which about one gallon of water could be frozen in the course of one hour. One of the above-mentioned freezing mixtures is the agent by which the result is accomplished. The machine itself being simple in its construction is, of course, not costly, but as the chemicals used are bulky and as a large amount of them is required, it is inconvenient and expensive. This kind of machine promises only to be of very limited practical application. The cheapest material to produce cold being the above mixture of sulphate of soda and hydrochloric acid, the first of which costs at present, wholesale, 3 cents, and the second, 6 cents a pound; making the cost of six pounds of ice 42 cents or 7 cents a pound—a price which can never compete with that of natural ice except in out of the way localities in the extreme southern States, where ice is occasionally sold for 10 cents per pound, and often cannot be had at all.

If the chemical products of the freezing mixtures had any commercial value it would diminish the price of the ice produced, but unfortunately this is not the case. For the benefit of those who wish to use such machines, or experiment in this line we give here the result of experiments with some of the best cooling mixtures.

TABLE OF COOLING AND FREEZING MIXTURES.

MIXTURES.	PARTS.	DESCENT OF THERMOMETER.
Sulphate of Soda	6	60°
Chloride of Ammonium	4	
Nitrate of Potash	2	
Diluted Nitric Acid	4	
Sulphate of Soda	6	66°
Nitrate of Ammonia	5	
Diluted Nitric Acid	4	
Sulphate of Soda	8	50°
Hydrochloric Acid	5	
Nitrate of Ammonia	3	34°
Diluted Nitric Acid	4	

Experiments have proved that the addition of common salt is not advantageous when no snow or ice is used in the mixture, but that, on the contrary, it diminishes the cooling effects of other salts, and in some cases even produces a rise of temperature of a few degrees. This is especially the case when common salt is dissolved in any of the previously made solutions of chloride of ammonium, sulphate of soda, common saltpeter, or nitrate of soda. When, on the other hand, one of the four last named substances is dissolved in a previously made solution of common salt, a descent in temperature of from 10° to 20° Fah. is the result. This is only mentioned to show what an immense field of investigation there is yet open in this special branch alone.

Social Science in the West.

A call has been issued signed by a large number of professional men, as well as many who do not lay claim to that title, for a meeting to be held in Chicago, on the 10th of November next, at some place to be hereafter announced, to organize a Western Social Science Association.

It is stated that the organization is intended to be similar in character and design to the British Social Science Association, and the coöperation of the most able and earnest men in the West is hoped for as well as the sympathy and coöperation of all public-spirited citizens throughout the United States. A number of valuable papers are promised, and the subjects of education, public health, and jurisprudence will be freely discussed. The Association is designed to be kept free from sectarian and party influences, and its discussions will be published so far as its funds will permit. We most heartily wish this and all other efforts to correct the prevalent evils of society the utmost prosperity and success.

THE manufacturing establishments of Lawrence, Mass., were honored lately by a visit from the Chinese Embassy. The busy activity of a New England manufacturing town, must excite the extreme wonder of these Orientals.

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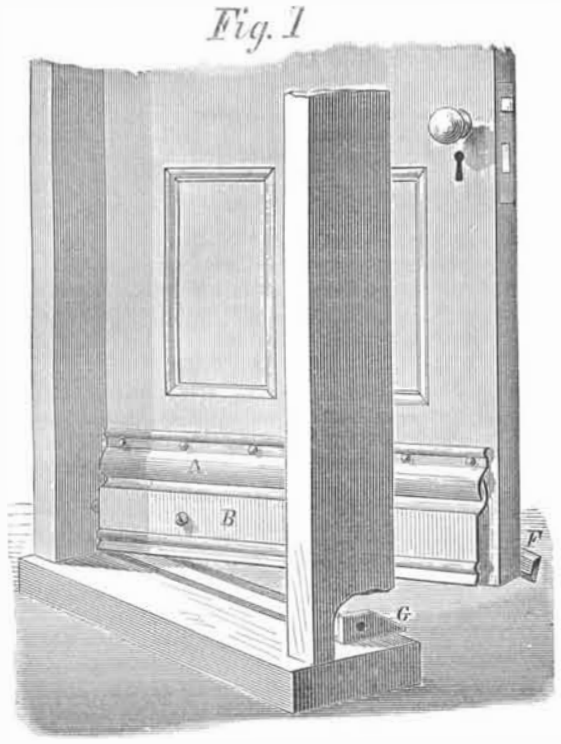
AVERILL'S METALLIC WEATHER STRIP.

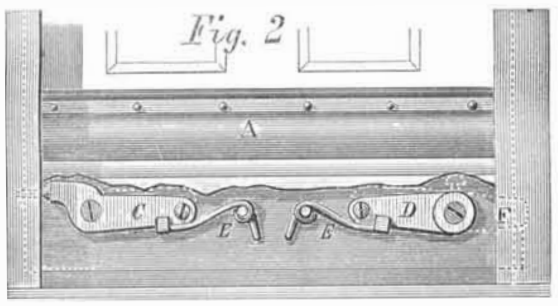
Those weather strips generally in use which depend for the closing of the joints between doors and windows and their frames on the elasticity of some substance, as rubber interposed, sometimes become unreliable by wear, and require renewa o repairing. The one which the engravings illustrate

Fig. 1



is of metal, and its operation is absolute. It consists of a beaded or corrugated strip, A, nailed or screwed to the door by its upper edge, and slightly projecting from the door at its lower edge to receive the upper edge of a plate, B, also of corrugated sheet metal. This plate is held in place by two screws or rivets which pass also through the long arms of the levers, C and D, Fig. 2. The springs, E, same figure, are coiled around pins in the door, and serve to throw the long ends of the levers up when once depressed. It will be seen that, if these levers are either depressed or raised, the slide, B, must move with them. This movement is produced on the lever, C, at the hinge edge of the door by a screw in the jamb of the

Fig. 2



door, the head of which meets the backward projection of the lever, C depressing the other end, and with it that portion of the slide. As the door nearly reaches the closing point, a latch, F (dotted lines in Fig. 2), is made to move by sliding up the incline of the catch, G, thus lowering and firmly closing the slide onthe sill. The contrivance may be adapted also to windows by a slight modification.

The patent, obtained through the Scientific American Patent Agency, is dated July 7, 1868. State and County rights, or the strips themselves, may be obtained by addressing the patentee, B. F. Averill, Dunkirk, N. Y.

FRUIT CAR—EASTERN MARKET FOR WESTERN PRODUCTIONS.

On Wednesday, Sept. 9th, we made an examination of a railroad car built specially for the transportation of fruits, fresh meats, game, etc., over long distances. It is known as the Davis' Fruit Car, built for the purpose of conveying perishable articles of food and preserving them from decay. The sides, ends, and roof of the car, are about seven inches thick, composed of the outer shell of plank, an air space, and a space packed with wool, felt, or other non-conductor. On the sides, inside the inner shell, are cases of zinc, reaching from the floor to the roof, and filled with broken ice, sprinkled with salt. The interior of the car showed, by the thermometer, a temperature of 40° Fah., and the cargo—peaches picked near Cincinnati, Ohio—after a voyage of six hundred miles, and a confinement of ten days, proved, on experiment, to be perfectly fresh and sound. This fact is, of itself, sufficient to show the value of the invention. It will, if properly managed, give a new impetus to the agricultural industry of the West and South, provide the craving East with fresh fruits and meats at a cheap rate, and be a new bond of interest connecting distant sections of our common country.

We hope, soon, to publish an illustration and full description of this improvement.

The Velocipede Fifty Years Ago.

The "velocipede," which is now attracting attention, is simply a new name for the same kind of invention which was in quite general use some fifty years back. It was then called a "dandy horse," in England, probably from their use being mostly confined to the dandies of the period. At that time the fashionable men might have been seen on any of the popular drives, propelling along, with their coat tails at an angle of forty-five degrees to the infinite satisfaction of themselves and the envy of the non-possessors of the coveted establishment. The vehicle of that period was constructed like those lately introduced, excepting that it lacked the pin on the front wheel by which it could be kept going when once fairly started. It was propelled by the feet upon the ground, and after a good speed had been attained, the feet were temporarily rested upon a small projection at each end of the front axle until the horse required further propulsion. The dandy horse, however, died out of use about the year 1820, in some measure owing to several serious accidents through their use, chiefly ruptures, which the springless nature of the rider's seat was very apt to produce. But they were in high feather once, and Fox, Sheriden, Pitt, and other notables of the period patronized them extensively in St. James' Park, taking their "constitutional" on the dandy horse after a hard night spent in the House of Commons, or around the gaming table.

WHAT SCIENCE OWES TO MISSIONARIES.

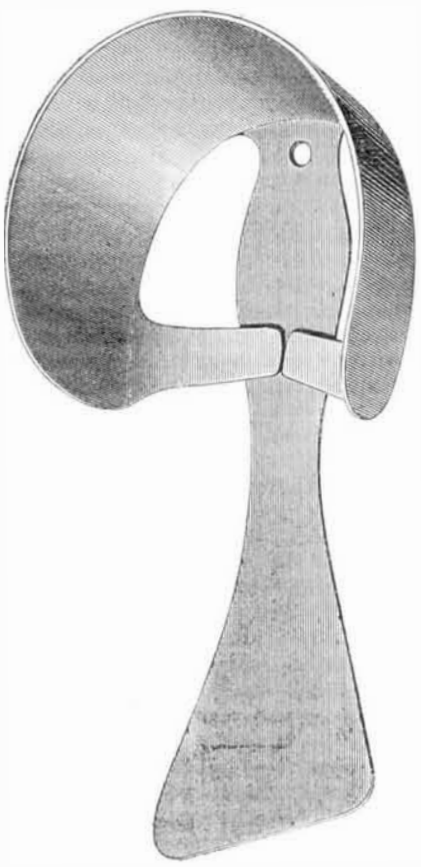
Far away upon the extreme verge of civilization, or isolated from it entirely, are a corps of humble workers. Bearing the tidings of mercy to the lands that sit in darkness, they gather up scattered pearls of knowledge and send them back to enrich the stores of those, who, laboring in another field, are coworkers with them in the elevation of the race. Scarcely any of the sciences can claim that they have not been indebted to missionaries for valuable facts. The sciences of philology, ethnology, archeology, geography, and zoology, have however received more aid from them than many others. An exchange makes the following remarks in reference to this subject:

"To Dr. Livingstone, the distinguished missionary explorer, is the world indebted for the most of its knowledge of the interior of Africa; and it now appears that the first discoveries of the sources of the Nile were made by missionaries. Some missionaries of the Church Missionary Society in East Africa, in order to acquaint themselves with the native tribes, made exploring tours to the interior, in one of which they discovered a snow mountain, and after a time another. The statements which they sent to England were at first received with incredulity and ridicule. After some time they reported that the natives declared that there was a great inland sea; when the Royal Geographical Society sent out an expedition, which resulted in the famous discoveries by Captains Speke and Grant and Sir Samuel Baker of the great lakes, called by them them the Victoria Nyanza and the Albert Nyanza, the sources of the great river of Egypt."

Dr. Kane received valuable aid and counsel from the Moravian Missionaries, on the coast of Greenland, in his celebrated Arctic explorations. The Catholic priests who penetrated the wilds of America, intent upon the conversion of the savages, contributed largely to the early knowledge of the geography of the American continent, and the information given by missionaries in China and Japan has been the origin of the negotiations which have resulted in the opening of the ports of those countries to commerce and civilization.

SAVOY'S PATENT METALLIC BOOT AND SHOE SHANK.

Some boots and shoes do not "live out half their days" simply for want of proper heel staying. The mixture of



leather skivings and paste, often if not generally used for heel stiffenings, is all that is required so long as kept dry; but when softened by the perspiration of the feet or exposure to rain it breaks down, and for use and comfort the boot or shoe is valueless.

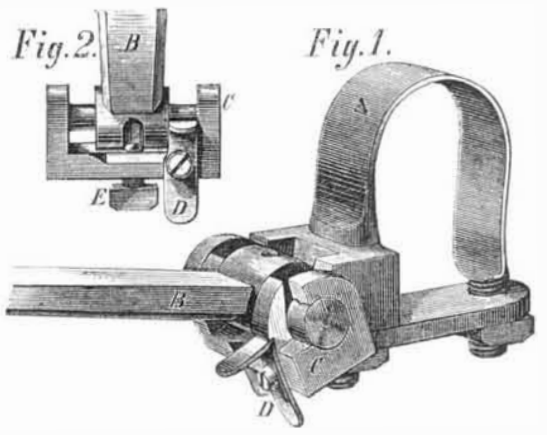
The accompanying engraving presents a view of a metallic shank intended to be a permanent support to the heel. It is cut out of sheet metal in one piece and then "struck up" or formed by dies. The strip or shank that passes under the foot lengthways may be made to act as a spring, if the material used is of sufficient density and hardness, as rolled sheet brass or sheet steel. Its application to the shoe is easily seen. The metal being entirely covered no portion of it comes in contact with the foot of the wearer. It may, if necessary, be secured by one or more rivets, screws, or nails.

Patented through the Scientific American Patent Agency, Sept. 1, 1868, by Michael E. Savoy, Luzerne, Warren Co., N. Y., who desires to dispose of rights upon reasonable terms.

M'CREARY'S PATENT CARRIAGE CLIP.

The design of this improvement is to prevent the vexatious rattling of the shafts of a carriage and to permit them to be instantly removed or replaced. Usually the pivot is secured to the clip, but in this case it is at the end of the shaft. The ears of the clip, A, are not bored, but slotted, forming hooks which receive the ends of the pins or pivot. This pivot passes through the shank, B, and is secured in the ears of a strap, C, which thus forms a part of the carriage shaft and when the shaft is in place its ears are outside those

Fig. 2. Fig. 1.



of the clip. A light spring, D, on this strap engages with a notch on one of the ears of the clip and prevents the strap from turning and the end of the shaft from becoming disengaged by jolting. A set screw, E, through the bottom of the strap, C, is seated in a partially circumferential slot on the shank head, and prevents all rattling by lateral motion while it allows sufficient vertical movement to the outer end of the shaft. By a slight pressure on the spring, D, the strap, C, is allowed to turn so the shaft may be lifted out of the hooked ears. Carriage makers will easily understand the construction and operation of the device. Fig. 1 is the clip and the attachment complete, ready for use, and Fig. 2 the shaft shank and strap without the clip.

Patented July 28, 1868, by Thomas McCreary, assignor to himself, George B. Sullivan, and John McCreary, all of Matteawan, N. Y.

HALF A DAY AT COLLINSVILLE.

A correspondent thus graphically describes what he saw in a recent visit to the works of the Collins Company, at Collinsville, Conn.:

Collinsville, town of Canton, Hartford county, is a brisk place. The village is only an overflow of The Collins Company, but the effervescence of industry has driven the foam of new houses up and down the green banks of the Farmington river, and here and there the white bubbles have been caught and held aloft upon the steep hillsides. From a single old mill, which David C. Collins and Samuel W. Collins began with forty years ago, has sprung a great multitude of houses, three churches, two hotels, a bank, schools, libraries, and all the auxiliaries of a population of three thousand.

In that old mill Collins & Co. began as ax-makers, with an ambition to make the very best tool that could be produced, regardless of the cost, believing that such a tool would inevitably win its way. They were right. It would seem as if the artisans of the blunt, rude axes previously made must have been men of sentiment, forging the tool to execute the purpose of the song, "Woodman, spare that tree!" Collins & Co. held that the ax ought to respond to the needs of the woodman, as much at least, as to the romance of the trespassing protector of the "shade;" so they made an ax keen as to the edge, ground and polished as to the sloping check, solid as to the eye—such an ax as had not before been seen. The success was immediate and immense. From Maine and Canada, from the South, and from the farthest Western frontier, from Spanish America, and from the Islands of the Sea, came a call for the new axes. The fortune of Collins & Co. was made.

In 1834 the Collins Company was organized under a legislative charter. They multiplied their mills until now they stand thick set, twenty-three in number, and so spacious that if they were stretched out on a single floor, they would measure twenty-five feet wide and a mile and a quarter long! They multiplied their wares, turning out, in addition to axes, also hatchets, adzes, mining tools, crowbars, sledge hammers, the long Spanish knives called machetes, and many agricultural tools. They increased their capital to $800,000, and have regularly declared satisfactory dividends.

A large item of their trade for years has been the Spanish tools—knives, axes and machetes. The semi-Spanish nations of Central and South America were formerly furnished with their weapons and implements from Europe, but they now receive them almost wholly from the United States, and very largely from the Collins Company. They probably found these articles of superior quality, both in stock and finish, to justify the partiality.

The Spanish tools are of peculiar pattern, and would not

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find extensive sale hereabouts. The knives are gotten up in various shapes of ferocity, some of them similar to those seen in the hands of the lowering gentlemen who attitudinize in the *New York Weekly* and the novels of the sanguinary marine school. The machetes are quite different from our cane-knives, being as long as swords, and resembling them, but broader at the end. Of these the Collins Company has manufactured more than three hundred patterns, and they are made from the very best of steel. Here is another tool which not even the sharpest Yankee could guess the use of. It has a handle like that of a knife, and the blade is eighteen inches long, and eight or ten inches broad in its broadest part, toward the end, and an eighth of an inch thick, ground to an edge, and polished all over. What is it? A weapon for defence or offence, you would say; possibly a heavy pruning knife, or a light butcher's cleaver. Wrong again. This is a Brazilian hoe! The rural operator squats down by a hill of corn, holds the handle in the right hand near the ground as a pivot, and grasps the end of the blade with his left hand and moves it mildly around toward the roots, poking the soil up to the little hillock! Perhaps this seems very primitive to us, but it is quite certain that our method seems as foolish to our brethren of the south, for when a Yankee went down with a cargo of our hoes, they refused to tolerate the "awkward things," but forged them into hoes of their own fashion Of these tools—mainly of the cane machetes—the Collins Company manufacture sometimes more than 200,000 a year.

During the last decade the Collins Company have "taken hold of the plow," and have brought it to a high degree of perfection. They make it of cast steel—the only one of the kind in the world. The plow is one of the oldest of imple ments fashioned by the human hand. We can scarcely be certain that Cain had a plow of his own when—a young man of a hundred and fifty—he farmed it on a small scale and without great success in the suburbs of the city of Enoch, "to the eastward of Eden;" but even Adam might have lived to see one, for he exhausted the best part of a thousand years, and doubtless be held the sparks fly from the anvil of Tubal Cain, his blacksmith descendant of the eighth generation. And if they had iron, is it not probable that they made some sort of rude plow?

The first plow of which we have any description is figured roughly on the monuments of Egypt. It seems to have been a mere wedge, with a short beam and a crooked handle. But Moses and Samuel speak of the plow, and even at that early day it possessed both a coulter and a share, as we learn from their similes. The plow of the Israelites, like the modern plow, was drawn by a yoke of oxen, and it was forbidden by law to yoke an ox and an ass together. The early Greek plow had a wheel. Most of the old rustic authors referred to the plow; Virgil wrote of it in the Georgics; Homer sang of it; and Pliny, Hesiod, and Strabo spoke of the methods of making it. Varro tells of a plow with two mold boards. The plow of the ancient Britons was very rude; no man was regarded as fit to be a farmer until he could make his own. The custom was to fasten the plow to the tails of the oxen, and compel the beasts thus to drag it through the ground. An act of the Irish Legislature was passed in 1634, entitled "An Act against Plowing by the Taile," which prohibited the cruel custom. The old Scotch plow was thirteen feet long; the iron part proper being over four feet. The Dutch originated the present style, and brought the plow of the last century to the highest perfection. Thomas Jefferson, before he became President, patented an excellent plow, of which he avowed that the shape of the mold-board was mathematically correct to obtain a perfect furrow with the lightest draft.

In 1860, Mr. F. F. Smith, a shewd, ingenious blacksmith, made his appearance at the Collins works, told what sort of a plow he thought was needed, and said he believed he could make it. The Collins Company cordially joined him, and the result was a plow cast solid from cast-steel, the first ever made. It was found equally adaptable to turf, stubble or fallow land; and those who have used it, aver that it draws easier and takes a land polish better than any other plow. It costs more, too; but it lasts four or five times as long. Any part can be obtained at any time, if necessary to renew it. The share may be heated and drawn out from time to time by any blacksmith. One hundred plows were made, and sold with great difficulty, in 1861. Now, fifteen thousand a year are made, and this patent is rapidly superseding the unreliable sheet-steel plows on the prairies of the West. Such a sudden capture of the market is almost unprecedented in agricultural implements. These plows have been broken here and there to prove their quality, and pocket-knives, cork-screws, saws, and cold-chisels have been made from the fragments. Of some such malleable stuff must the plows have been made that turned up the valley of Jehosaphat; for Joel (chap. iii. verse 10,) calls upon the farmers to forge them into swords. The cast-steel plow of Collins Company is now used, not only in every State of the Union, but in Spanish America, Australia, New Zealand, and in several of the countries of North-western Europe. And still it rapidly extends its peaceful empire.

Have we time for a hasty glance through these works that spread their roofs under the hill like a Japanese city? Let us approach, and enter the low-browed Tartarus. Here at the left is the converting furnace where bars of wrought-iron are thrust into pulverized charcoal, and in a fortnight come forth bars of steel, having found marvelous properties in the contact. Wrought iron is merely a pure iron—a chemical simple—it attains the wonderful adaptability and excellence which give the name of steel, by receiving one-half to one per cent of carbon; and on receiving five per cent of carbon, its form has experienced another radical change, and it has become cast-iron.

Within these inner shops are sweating laborers—a whole regiment—forging the weapons wherewith the farmer and pioneer are to subdue Nature from her rebellious moods.—Here they "Heave O!" under great derricks, and swing tuns of crude metal into place; here they dodge to and fro in the blaze of an awful furnace, grimly suggestive of the quarters which I trust have been prepared in the nether worlds to swallow up hereafter all who don't believe as I do; here they move caressingly about sundry tender moulds; here they preside over a monster like a wool picking machine, into which craws a wheel with long machetes thickly clasped on its periphery—the monster utters a muffled scream, and the dull blades come forth ground and gleaming; here they couch before two score of mighty trip hammers that shout their metallic salutations; here they hover over half a hundred great grind-stones, pressing to the rough attrition, axes, plows, hammers, wrenches, hatchets—stones whose predecessors have burst like bombs. and shot up through the smoky roofs, at the risk of limbs and human heads; here they warily watch huge ovens where tools are baking, and huge tubs where tools are cooling. A vast machine this is—vaster than the spectral shops where the Titans forged the shield of Achilles—and into it go, every year, 10,000 tuns of coal and 6,000 tuns of iron, and out of it fly, over States and seas, 5,000 tools a day!

Does the reader know how an axe is made? A bar of heated wrought-iron is cut up into chunks, and an eye is punched into it by the same movement; then it goes into the bitt shop, where a piece of steel is clasped and welded to the iron and drawn to the edge, then to the temperers to receive their delicate manipulation; then into the grinding shop; then to the polishing shop; then to the blacking room, where the asphaltum is put on to protect the head of the axe; then to the packing room. And while passing through each one of these processes, the instrument is handled by a different professional inspector, and if there is a flaw, or if the temper is faulty, back it goes to the beginning. The Collins method is especially characterized by this rigid scrutiny which assures an excellence remarkably uniform in each completed tool.

The company is managed by a board of eleven directors, all of whom reside in Hartford, except two. One of these is Samuel W. Collins, who has been connected with the company ever since it was established, and whose name and skill first gave eminence to the firm. It has never been my fortune to meet him; but I am told that while maintaining strict discipline, he is very public spirited, and beloved throughout the town. The other is Vice-President Wm. J. Wood, Mr. Collins' enterprising associate.

So much in forty years; how much in forty years more? say, about the year of grace, 1,900? What other wheels and shafts and furnaces and forges will be added? What other inventions? What miracles of steam? What other working bees will buzz through this sweltering hive? And what other homes, flanked with rich gardens, will blossom up and down this valley? May it not, until long after the dawn of that century day, be called from the peaceful fashioning of plow and axe; and may the company be as happy in its president then as it now is in that last of the Cheeryble Brothers, who give to the business his methodical wisdom, and presides with unanimous acceptance, over the village of iron workers.

W. A. C.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The Stark mill of Manchester is putting in two turbine wheels of 500 horse power.

The Saginaw Valley, Michigan, it is stated, will ship this season over four hundred feet of lumber to the Western cities.

A correspondent writes that a large deposit of emery has been discovered near Middletown, Conn. He states that numerous tests have proved its quality to be equal to the imported.

The Directors of the Boston, Hartford, and Erie Railroad have completed contracts for the entire distance from Boston to Fishkill, and expect to have it finished before the end of 1869.

Tin mines have been discovered in the Pollock district, Colorado. Two promising mines are being worked reported to yield ore containing seventy-five per cent of metal.

Out of 8,240 barrels of flour inspected at Philadelphia last week only 229 were condemned.

Northern capitalists have bought the old Court House at Macon, Ga., and are going to occupy it as a cotton and woolen mill.

The gold mining interests of Nova Scotia are looking up. A considerable number of mines are steadily worked, and prospecters are quite numerous. A new paper has been started in Halifax in the mining interest called the *Mining Gazette*.

It is said that Pittsburg capitalists have an eye upon the manufacturing facilities at Joliet, Ill., and contemplate the erection of large iron works at that place.

Twelve cars of freight were recently taken from New York to the present termination of the Pacific line, 1,200 miles west of Chicago. a distance of about 2,100 miles from the starting point, without transhipment.

WATER SUPPLY OF PORTLAND.—Portland, Me., is to be furnished with water from Sebago Lake about sixteen miles distant. The trenches for the mains are being rapidly excavated.

ECONOMY OF SCREW PROPELLERS.—Owing to the economy produced in the consumption of coal by the substitution of the screw for side wheels, the sum of $48,400 is annually saved to a single line of French steamers running to New York.

ENGLISH AND AMERICAN RAILWAY CARRIAGES.—Three American carriages weigh only one tun more than two of the English make, and will seat seventy-two more passengers. They are also more durable, and for these reasons are much preferred in South America, which depends chiefly upon the United States for its supply.

The Hartford & New Haven R.R. Co. are relaying portions of their road with steel-headed rails, which are fastened with screws and rubber washers in such a way that the destructive jar of the trains is almost entirely obviated.

PHENOMENON IN INDIANA.—A portion of the track of the Bellefontaine and Indianapolis railroad, about 250 feet long, sank fully sixteen feet and the ground around sank with it. Traffic was interrupted until the track was raised by "cribbing." Fish from twelve to eighteen inches appear where the water has risen out of the crack. A subterranean lake is supposed to exist under the track.

CAVING OF THE CHICAGO RIVER TUNNEL.—The heavy rain and the breaking of the water pipe caused a section of the tunnel now being constructed under the Chicago river to cave in on the 2nd inst. The temporary railroad bridge on West Water street, an immense derrick, and the engines attached went down in ruins. The loss is estimated at $25,000.

FREIGHT TRAIN ACCIDENT.—A freight train on the Boston and Albany rail road, broke through a bridge at Russell, Mass. Just after the engine had passed over, thirteen cars, two of which contained kerosene, went into the chasm. Eight minutes later the kerosene exploded and the fire destroyed the cars and part of the bridge.

Dr. Lewis Feuchtwanger has sent us a specimen of pyrolusite (peroxide of manganese) which is as fine a specimen as we have ever seen. It was taken from the Pembroke mines in Nova Scotia and contains by analysis 36 per cent oxygen. It is entirely free from iron and is beautifully crystallized.

The contractors who built the Metropolitan Underground Railroad in London have made a provisional offer to construct the proposed underground road in New York city, and to furnish all the capital required to complete the road which the projectors may fail to obtain at home.

Large works have been recently established for the manufacture of chrome iron in Maryland and Pennsylvania. The demand for this metal in the arts has largely increased.

The first iron bridge made on what is called the solid lever plan has just been completed. It has a span of fifty feet and is fifteen feet wide. It weighs only five tuns. It was tested in Boston on the 2d inst., and sustained a distributed load of 86 tuns.

THE OPHIR MINES.—The returns of the Ophir mines for the month of June amount to 357 ounces, while for the month of July it was only 247 ounces, operations being interfered with by low water. A heavy rain storm on the 22d of August again filled the steams so that there is now enough water to run the crusher at full speed. A new lode has been discovered in the Ophir ground fifty feet from the old "South Lode" which gives good promise.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the most noteworthy recent home and foreign patents.

FARM GATE.—Lewis Charles, Clear Springs Md.—This invention is a neat, cheap, and easily constructed slide gate, so arranged and operating that it will ordinarily open a passage wide enough to admit a single animal; but, when necessary, can be easily opened to admit a team of any size.

MACHINE FOR MOLDING AND PLANING IRREGULAR FORMS AND CURVED SURFACES.—J. P. Grosvenor, Lowell, Mass.—In this machine there are several improvements upon those heretofore in use, including a new method of constructing the table to prevent its jarring and vibrating, a new feeding device for the manufacture of curved frames, and a new method of adjusting the cutters.

MACHINE FOR PLANING AND MOLDING IRREGULAR FORMS.—J. P. Grosvenor, Lowell, Mass.—The object of this invention is to obtain a simple and inexpensive attachment to machines for molding irregular forms, by which the operator, while leaning over the table of the machine and closely inspecting the operation of the cutter, will be enabled to adjust the cutter head up or down, to any required degree, without removing his eye from his work.

SPUR WHEEL.—C. F. Woodruff, Newbern, Tenn.—This invention is an improvement upon the device patented by the same inventor, May 5, 1868, No. 77 700, and consists in forming the cogs with shoulders so expanded as to bear against each other all around the rim of the wheel, and in trifurcating or dividing the outer ends of the spokes, or radial arms, in such a manner that the inner ends of the inserted cogs shall be inclosed and firmly held between the forks of the radial arms, whereby the whole wheel is made stronger and firmer than as heretofore constructed.

FANNING MILL.—Wm. Stoddard, Winona, Minn.—This invention consists of an improved agitating apparatus for facilitating the feeding of the grain from the hopper. Also, an improved apparatus for separating oats or other long grains from wheat. Also, in combination therewith, of an improved screening apparatus for separating cockle and other small grains from the wheat.

RECTIFYING APPARATUS.—W. G. Barette, Canton, Md.—This invention consists of an arrangement of condensing chambers and a cooler for separating and returning the oils. Also, of a condensing and returning apparatus for the low wines; and also of an arrangement for taking off the low wines at the latter part of the operation.

STOVEPIPE SAFE.—Gunder E. Hammer, Rochester, Minn.—The object of this invention is to provide a ready means of access to the air chamber of that class of stovepipe safes which are constructed of sheet metal in two parts, having an air chamber between them and provided with openings for the passage of air through the said chamber. It consists in constructing one or both ends of two parts and hinging one of the said parts to the cylindrical portion.

LAMP CHIMNEY CLEANER.—M. N. Lovell, Erie, Pa.—This invention consists in one or two curved handles provided with clamps, whereby a number of slips of soft paper may be clamped to the said handle upon the bent portion thereof in such a manner that the slips may be turned over like the leaves of a book, and one after another used as they become foul, the said cleaner to be inserted in the chimney when used, in the ordinary manner.

KNITTING MACHINE REGISTER.—B. B. Bolinger, Louisville, Ohio.—This invention consists in providing a pattern wheel the periphery of which is provided with notches, corresponding in distance from each other with the changes required to be made in the knit fabric, and which is operated through the medium of gearing connected to a ratchet wheel which receives motion from a pawl connected to some regularly intermitting moving part of the knitting machine, the periphery of the said notched wheel causing a bell hammer to strike as each notch passes a given projection on the arm of the bell hammer, different signs and figures of pattern wheels being provided for different kinds of work.

CORRECTION—RUBBER BILLIARD BALLS.—In our notice of this new invention, on page 167, current volume, in was incorrectly stated that "the constant expense for renewing the stock of billiard balls amounts for each table to $32 for eight sets per year." But the fact should have been stated thus: The expense of renewal is from $25 to $35 each set per year.

ENVELOPE.—Sigismund Ullman, New York city.—This invention relates to a new and improved mode of cutting envelopes, whereby the same, when folded and fastened or sealed, will not admit of letters or documents being abstracted without defacing or tearing the envelopes. The invention further relates to a new and improved application of an eyelet seal or fastening to the envelope, whereby the former are permanently attached to the latter, so that they may be sold with them, and purchasers or users enabled to seal the envelopes with the greatest facility.

BRICK MACHINE.—Peter Hayden, Pittsburg, Pa.—This invention relates to a new and improved machine for molding and pressing bricks, and it consists of improved means for conveying the clay from the crushing or rolling mill to the press boxes, and also in a novel and improved construction and arrangement of parts for molding and compressing the clay and discharging the same after being compressed.

ENVELOPE.—S. Ullman, New York city.—This invention relates to a new and useful improvement in envelopes, and has for its object the folding of the ends of an envelope in such a manner as to effectually preclude the possibility of letters or money (bills) being abstracted without tearing or defacing the envelope. Letters and money are at present frequently abstracted from the ordinary envelopes by means of a bent wire and other instruments without injuring or defacing them in the least.

COOKING APPARATUS.—J. S. Field, Brooklyn, N.Y.—This invention relates to a new device for boiling by steam various articles in one single vessel, which is divided into various compartments by fixed partitions, so that the articles to be boiled may be separated from each other that they might retain their original flavor.

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WATER WHEEL.—Vincent M. Baker, Preston, Minn.—This invention relates to a new and improved water wheel of that class which are placed on a vertical shaft and are commonly termed "horizontal wheels."

POCKET-BOOK PROTECTOR.—Alfred Arnemann, Guttenberg, Iowa.—This invention consists of a spring catch attached to the pocket-book, and of a wire clasp fastened to the pocket or garment. The spring catch can be easily fastened to the clasp, whereby the pocket-book will be securely locked in the pocket or to the garment.

FACE TESTER FOR MILL STONES.—James Kuhn, Mount Pleasant, Penn.—This invention relates to a new and useful substitute for the "staff," which is now used for marking the faces of mill stones in order that they may be cut down and brought into a plane when rendered uneven by wear.

LOCOMOTIVE BOILER.—Quintin Parker, New York city.—This invention relates to a new manner of constructing the fire places of locomotive boilers, and its object is to produce a boiler in which the lower flues cannot be clogged by cinders and ashes, and in which a fire place of just sufficient size is arranged. The invention consists chiefly in the application of a discharge channel, through which the ashes, cinders, and other impurities can, from the inclosed plate in rear of the flue sheet, fall to the ground so that thereby the lower flues are kept clear.

GRAIN MOISTENER.—L. J. Adams and J. H. Esale, Avon, Ill.—This invention has for its object to moisten and toughen the bran of hard or frozen wheat and soften the berry so as to raise the quality of the flour and facilitate the bolting of said flour.

BIN FOR SUGARS, TEAS, ETC.—Morgan L. Rich, Sand Bank, N. Y.—This invention has for its object to improve the construction and arrangement of sugar bins so as to make them more convenient in use, the bins being arranged more compactly than is possible when they are constructed and arranged in the ordinary manner.

BINDING ATTACHMENT FOR REAPERS.—Joseph K. Bull, Buckingham, Iowa.—This invention has for its object to furnish an improved attachment for reapers to facilitate the binding of the grain, and at the same time to enable the bundles to be deposited upon the ground in groups of six or more.

WAGON BRAKES.—Hugh Davidson, New Salem, Ill.—This invention has for its object to furnish an improved automatic brake which shall be so constructed as to adjust itself properly to all positions of the wagon, which can be cheaply and easily made by any blacksmith, which shall be more durable than other brakes now in general use, and which shall be capable of being applied to any wagon.

CHALK AND SANDPAPER HOLDER.—Charles F. Ritchel, Chicago, Ill.—This invention has for its object to furnish a neat, simple, and convenient chalk and sandpaper holder for billiard cues, which shall be so constructed and arranged as to be easily carried in the pocket so as to be ready for use at any time.

CORSETS.—Mrs. Emilie J. Meriman, New York city.—The main object of the present improvements in corsets is to so construct the same as to relieve the hips of the wearer, from the great weight of the clothing which with the use of the ordinary corsets bears thereon, and transferring it to the shoulders in such a manner as to cause no feeling of uneasiness, and to allow the greatest possible amount of freedom of movement to the waist or body.

TELEGRAPH INSTRUMENT.—Robert K. Boyle, New York city.—This invention relates to a new telegraphic printing apparatus, which is so arranged that it will adapt itself to every variation of the weather, and that it will utilize the whole power of the current. The invention consists, first, in a new arrangement of connecting the magnet with the electro magnets. In this apparatus four electro magnets are employed, a pair being arranged on each side of the horseshoe magnet. The two electro magnets on each side are arranged one above the other. Two horseshoe magnets are firmly secured to an oscillating horizontal bar, in such a manner that each end of each horseshoe is between the two opposite face plates of two opposite electro magnets. By means of this arrangement the through current, which is generally obtained, is avoided, and the horseshoe magnet will more easily change its position when the polarity of the electro magnets is reversed.

GAS MACHINE.—Hiram S. Maxim, New York city.—This invention relates to a new gas machine which is so arranged that the production of gas will be entirely automatically regulated, and that the volume of gas as well as its pressure, is under automatic control. The invention consists in the arrangement of the various devices for regulating the pressure of the evaporated gas, for regulating the quantity of illuminating gas made, and for regulating the supply of air to the machine.

REGULATING WATCHES.—Frank G. Johnson, Port Richmond, Staten Island, N. Y.—This invention relates to an improvement in watches, whereby the regulating hand of the watch is so operated that it may be adjusted with the greatest nicety, and the invention consists in fixing a fine thread screw in the watch, with a movable grooved nut thereon, which nut, as it is turned on the screw, moves the regulating hand.

COMBINED SPUR AND CREEPER.—Ferdinand Mehrmann, Fountain City, Wis.—This invention consists in providing to the sides of an ordinary or suitable spur, a bow-shaped bar or plate with teeth on one side; said plate or bar can be either turned forward under the sole of the boot or shoe, to be used as a creeper, or it can be folded back over the heel, where it will be out of the way, the whole instrument being then only a spur. By means of a suitable fastening device, the bow can be locked to the spur in either position.

MEAT CHOPPER.—Thomas Payne, Grand Rapids, Mich.—This invention has for its object to furnish a simple, convenient, and effective machine for chopping sausage meat and other substances, which shall be so constructed and arranged that the chopping box may be revolved automatically, with a slow and steady movement, bringing a new part of the substance to be chopped beneath the knives at each stroke.

SERVICE PIPE FOR WATER OR GAS.—Edward Hagan, New York city.—The object of this invention is to protect water or gas pipes from freezing up, and to provide a ready means of withdrawing and repairing such pipes when the same require inspection, cleaning out, or repair without the necessity of digging up the whole length of ground pipe from the main, thus avoiding delay, inconvenience and great expense.

LADDER FOR LAMP-LIGHTERS.—M. M. Smith, Nashville, Tenn.—The object of this invention is to provide a simple, portable, and effective step ladder for the use of lamp-lighters.

FANNING MILL.—H. A. Snyder, Shullsburg, Wis.—The object of this invention is to provide a governor for fanning mills, which acts automatically to prevent the grain from being blown over the sieves when the fans are driven with very high velocity, or to so adapt itself to a low velocity that the grain will be perfectly cleaned in that case. It consists of a hinged board forming part of the box or cylinder, the said board being suitably connected with the gates which admit air to the box, that the movement of the said gates to shut off the excess of air to the box is dependent upon the movement of the hinged board, which latter is itself actuated to movement by the antagonistic forces of a spring and the current of air developed by the fan wheel. When the force of the current of air exceeds that of the spring, the board raises, and being connected with the gates, actuate them to shut off a portion of the entering air; but when the force of the spring is in excess, the board tends to approach the outer ends of the fans, and in so doing moves the gates to admit a greater supply of air.

COFFEE MILL.—Wm. H. Barns, New London, Conn.—This invention consists in placing a coiled spring around the arbor of the rotating grinding plate or runner, so-called, of a coffee mill or such other analogous grinding mills as are susceptible of and are improved by the application of the coiled spring as above mentioned.

CHURN.—C. M. Lightner, Harrisburg, Pa.—This invention consists in a cubical or oblong box, by means of suitable trimmers affixed to any two diagonally opposite corners of the said box, and providing the box with an internal dasher or revolving frame, which is actuated by suitable mechanism to revolve in a contrary direction to the box, and thus produce a thorough agitation of the milk, whereby butter will be formed in short time.

PIANO HAMMER.—C. W. Brewer, Racine, Wis.—The object of this invention is to obviate the so called bell tones which result when the lower octaves of a square piano are struck with force. The invention consists of a soft rubber tube, or volute, inserted in the felt portion of the modern felt and buckskin hammer head, and by this composite is produced the proper elastic action of the whole head.

STUMP EXTRACTOR AND REMOVER.—C. C. Manuel, North Troy, Vt.—The object of this invention is to provide a machine for extracting or removing stumps, large stones, and other ponderous articles. It consists in a strongly braced frame raised by uprights to a suitable hight above the axle trees of a stout running gear or wagon, and provided with mechanism for extracting stumps or lifting from the ground any ponderous bodies, as large stones, logs, and the like.

APPARATUS FOR DRAWING OFF STARCH.—Colgate Gilbert, Buffalo, N. Y.—This invention relates to a new and improved method of constructing apparatus for drawing off starch and other substances held in solution or suspension in water, whereby the separation of the starch or other substance from the impurities is effected automatically and perfectly.

BELTING, ETC.—Thomas Standring, Port Richmond, N. Y.—This invention relates to a new and improved method of constructing belting, or traces, or other straps now made of leather only, or of any one material, whereby the strength of the same is greatly increased.

PESSARY.—W. F. Chrisman, Trenton, Tenn.—This invention consists of an elastic airvessel composed of a combination of textile fabric and india-rubber, the layer of india-rubber being interposed between the textile material thus uniting the two layers of the latter. It consists also of the form given to the instrument together with a stop cock attachment therefor which latter is employed in inflating the same when in the vagina.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

R. S., of Mich.—Pozzolana is brought from Pozzuoli, near Naples, and consists of volcanic ashes, concreted into a cellular mass of a baked appearance and rusty color. When a proper proportion of it is made into mortar with lime and sand, it sets speedily under water, making one of the best water cements known.

R. L., of N. H.—To make a fine red lake, take coarsely powdered cochineal 1 oz., water and rectified alcohol each 2 oz., digest for a week, filter, precipitate with a solution of tin added every two hours until the color is all thrown down; wash with distilled water and dry. It will not pay you to make it on a small scale.

J. L. S., of Ohio.—A good whitewash for out door work is made by adding to ordinary lime whitewash two ounces of glue, well dissolved, to a gallon of the wash, and also one half a pound of whiting.

J. O. B., of N. Y.—The incense burned in Catholic Churches, is gum olibanum. It is best pure, but is frequently adulterated with turpentine.

G. W. F., of Mass.—Are hydraulic presses ever used for raising buildings? If so how is the power applied? Could the power of two men at the pump be sufficient to raise a large building? Ans. They are. The power may be any motive power used for any other purpose. The power upon the pump necessary to raise any given weight, depends upon the relative area of the pistons. Theoretically a press might be constructed so that a mouse could raise one of the Egyptian Pyramids.

G. L. M., of N. Y., writes us in regard to crank-engines. he thinks he differs from us in our views expressed on page 121 of the present volume, the fact is we are perfectly agreed. The difference is simply in the construction of terms. We used the term applied, in its philosophical sense, *i. e.* used to produce an effect. Mr M. will admit doubtless that the full application of steam to the production of motion is only made through a portion of the stroke in a crank engine. The admission of steam into the cylinder when the crank is in the dead center, would not be the application of steam to the production of motion because in that position no motion can be obtained. The words admit and apply are not synonymous.

C. M. B., of N. Y.—The subject of your letter, the use of compressed air as a motor and the utilization of waterfalls for that purpose, you will find treated in this issue under the head of "Transmission of Hydraulic Power." We shall write again on the same subject, as we deem it of great importance. The article also on page 179 current volume, entitled "Solar Heat," treats on a branch of the same subject.

H. E. L., of N. J.—This correspondent, referring to an article on paper on page 36, current volume, SCIENTIFIC AMERICAN, in which the okra plant is mentioned as a material for paper making, suggests "Bagasse" or "bergasse," the crushed sugar cane, as a possible useful substitute for rags in the manufacture of paper. He says that it may be obtained in almost unlimited quantities on sugar plantations, where the only use it is put to is as a fuel. The outer shell of the cane is similar to straw which has not yet proved to be a competent substitute for rags. The pith, we think, lacks the fibrous quality requisite for conversion into paper. We believe the address of the Okra Paper Company is 48 Pine street, New York city.

J. S, of Mass.—We know of no better varnish for loom harnesses than that made according to the following recipe, used by an overseer of cotton weaving of more than thirty years' experience: 2 gallons linseed oil; 2½ lbs. gum shellac; 2 lbs. litharge; 1 lb. red lead; 1½ lbs. umber, ½ lb. sugar of lead.

P. J., of Minn.—Why does not the gas in a pipe burn when it is lighted at the orifice?" Such a question is puerile. Hydrogen gas—the common "illuminating" gas—is not inflammable. It requires oxygen to produce and sustain combustion, and that is found in the atmosphere, which must be mixed with the hydrogen to produce a flame.

S. O. L., of Ohio.—Malachite is a native oxide of copper. The best specimens are found in Siberian copper mines. It is used for ornamentation as veneers generally, although now quite fashionable for brooches, ear drops, etc. Probably the finest native and wrought specimens in this country are those sent as presents to the late Gov. Thomas H. Seymour of Connecticut by the Emperor Nicholas of Russia.

T. of Malvern, Eng.—In the solution of the problem you send us you accept the velocity of the wave of sound as 2,000 feet per second, and the apparent velocity as 2,080 feet.—This is all wrong. The theoretical velocity uncorrected for temperature is 916 feet, corrected for temperature it is 1090 at the freezing point and one foot more for every degree above this; 1,100 feet at 42° Fah., 1,140 feet at 82° Fah., etc. Your calculation based on these, erroneous premises is therefore incorrect. You ask, "Who hears the true pitch of the whistle of a moving locomotive." Of course those who remain at the same distance from the sounding body, viz., the people on board the train, and those at a great distance at right angles to the direction of its motion; those whom the train approaches hear it sharper, those from whom the train departs, flatter than it really is.

F. M. B., of Ky.—The ink stains in the piece of goods you send us are to a considerable extent removable by pure water, without changing the original color. For what remains of the stains use, carefully, oxalic acid. The red color produced by the acid in the original dye can be restored by ammonia.

R. S. T., of Ala.—Kalsomine is composed of zinc white mixed with water and the sizing of glue. The surface to which it is applied must be clean and smooth. For ceilings mix half a pound of glue with fifteen pounds of zinc; for walls a pound of glue, with fifteen pounds of zinc. The glue, the night before its use, should be soaked in water and in the morning liquefied on a fire. It is difficult to prepare or apply kalsomine; few painters can do so successfully, Paris white is often made use of for it, but it is not the genuine article.

P. O. A., of Minn.—To make fire-proof mortar, take two-thirds of the best lime and one third of smith's black dust, and mix with the necessary quantity of water. The will form a mortar that will set nearly as hard as iron, and is the best to use for setting the firebricks in or about fire places.

S. M., of N. J.,—A printer's error vitiated our answer to your query last week instead of being, the superheating surface in marine engines is too *small* it should have been too *large*.

S. O. O., of Mass.—We can highly recommend the following recipe for paste for polishing furniture: Three ounces of white wax, half ounce of Castile soap, one gill of turpentine. Shave the wax and soap very fine, and put the wax to the turpentine; let it stand twenty-four hours; then boil the soap in one gill of water, and add to the wax and turpentine.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Send to T. Ellwood Zell, Philadelphia, for circular of a valuable work. Agents wanted.

Scientific American from the third year of its publication for sale. W. Clare Anderson, St. Louis, Mo.

Manufacturers of cotton bale ties send address to J. A. Shone, Holly springs, Miss.

Mr. Asahel Wheeler has the honor of a very complimentary letter on the merits of his Siccohast Oil, from Capt. Nicholson, of Her Majesty's ship, *Royal Alfred*. Having thoroughly tested it, he now orders a quantity. to be used in painting the *Alfred*, at Quebec.

Notice.—Abner Woodard, patent right agent. His address is wanted by E. G. Knowlton, Cleveland, Ohio.

I will act as agent, in North Missouri, for a good thing. Address J. F. A., Chillicothe, Mo.

Wickersham's American oil feeders save the expense of throwing away oil cups, when the cups fail to act. The same cup will always answer; no screws to regulate; nor does the atmosphere drive the oil out of the cup.

Wanted,—Makensie No. 2 2d-hand cupola. N. C. Stiles, Middletown, Conn.

For sale—the whole or a part of the patent right for a damper regulator for steam boiler furnaces, in successful use. Address Jas. F. Neall, 306 North 2d st., Philadelphia.

A. G. B., of N. B., can get his desired information by addressing J. Merry, 22 Leroy st., New York.

Fairman's new compound lathe chuck. Address, for description, Talford & Fairman, Manufacturers, Rochester, N. Y.

To license on royalty—my improved saw set, patented Aug. 25th, 1868. Address W. B. Weaver, Reading Center, N. Y.

Retorts for bone black.—Wanted, a set of retorts, and all iron works appertaining to it, for the purpose of making bone black. Also, plans and specifications for putting up the kiln. Address Wm. Henry, box 773, New York Postoffice.

Peck's patent drop press. Milo Peck & Co., New Haven, Ct.

Wanted—a machine suitable to crush quartz and bones. Send circulars and price list to E. D. S., Postoffice box 708, New Orleans.

Millstone-dressing diamond machine, simple, effective, and durable. Also, Glazier's diamonds, diamond drills, tools for mining, and other purposes. Send stamp for circular. J. Dickinson, 64 Nassau st., N.Y.

The toy Boomerang.—See Advertisement.

A foreman for a machine shop wanted,—one who has some experience in the business and can bring good recommendations. Address D. A. Brown & Co., Fisherville, N. H.

Wanted—a master mechanic capable of superintending a locomotive and machine shop. One thoroughly accustomed to managing men required. Address box 116 New York postoffice.

N. C. Stiles' pat. punching and drop presses, Middletown, Ct.

For sale—the whole or a part of a paper mill, all new machinery. For particulars address L. A. Beardsley, Fredericksburg, Va.

For sale—the patent right, in Great Britain, for perforated saws. The manufacture of these saws is now firmly established in the United States, and they are rapidly taking the place of all other solid saws Apply to J. E. Emerson, Trenton, N. J.

Prang's American chromos for sale at all respectable art stores. Catalogues mailed free by L. Prang & Co., Boston.

For breech-loading shot guns, address C. Parker, Meriden, Ct.

Wanted—a second-hand steam hammer. Norway Manufacturing Company, Wheeling, W. Va.

Winans' anti-incrustation powder, 11 Wall st., N. Y. 20,000 references. No foaming. No injury. 12 years in use. Imitations plenty.

NEW PUBLICATIONS.

THE THREE VOICES. By Warren S. Barlow. Boston: Wm. White & Co., publishers.

The author of this volume is not well known to literary fame; nevertheless he has produced a poem of 181 pages, which has the merit of a rhythmical composition classified under three headings—The Voice of Superstition, The Voice of Nature, The Voice of a Pebble—and partakes of the nature of a criticism upon things held sacred, and is not exactly orthodox in its theology. We have never considered it profitable to read skeptical works, for at best our ideas of the Christian faith are too loosely regarded, as a general rule.

PERSONAL HISTORY OF ULYSSES S. GRANT. By Albert D. Richardson.

We have received a copy of the above work of 560 pages from the American Publishing Company, of Hartford, Conn. Mr. Richardson is a very graphic and careful writer, and in his new volume he has grouped together a great variety of incidents in the life of the illustrious subject, which will be read with interest long after the heat and prejudice of party warfare has passed away.

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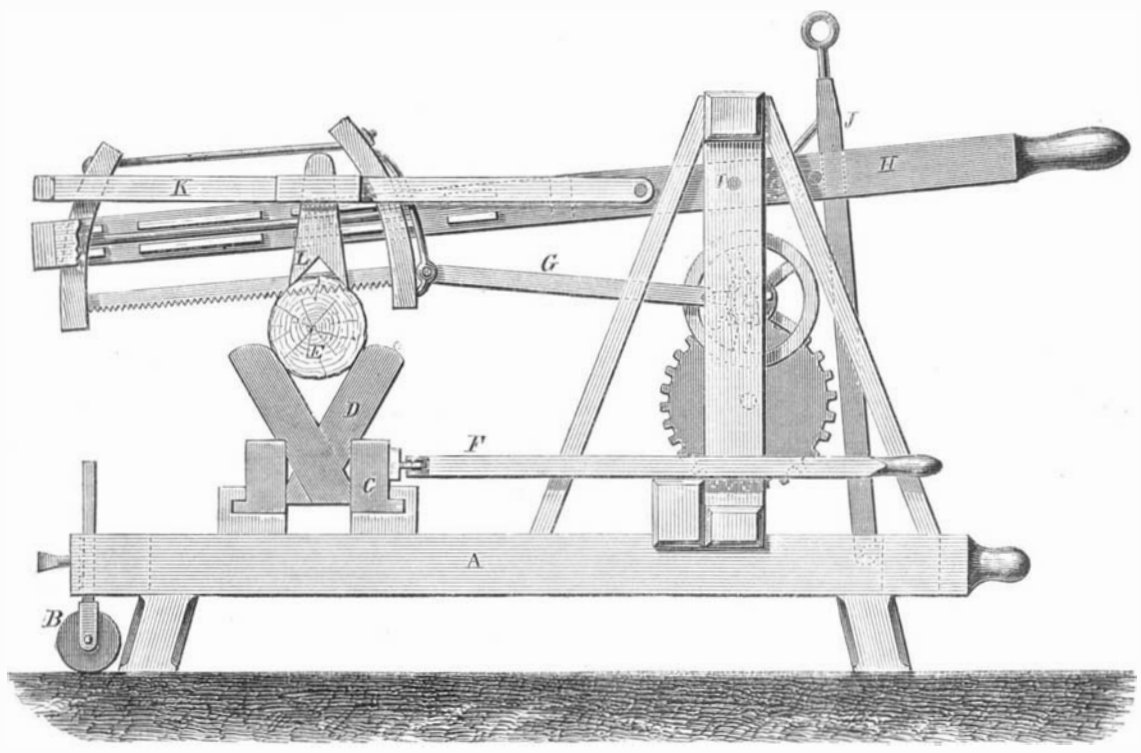
Improvement in the Application of the Common Buck Saw.

The engraving presents a view of a machine designed to take the place of the ordinary buck saw and horse, and applicable also to other purposes. The bed frame, A, is supported on legs and has at one end an adjustable truck, B, which may be lowered when the machine is to be moved from place to place, and act as the wheel to a barrow; the machine being propelled by means of the handles at the other end of the frame. Fixed to this bed is a transverse frame, C, extending beyond the sides of the bed, and carrying a sliding horse, D, for receiving the log, E, the horse being moved back and forth by means of the lever, F. Rising from the bed is an upright frame supporting two shafts; the lower one carrying a gear and having on one end a crank by which it may be turned, and the upper one having a pinion meshing into the gear and a fly wheel with crank attached. This crank is connected with the saw by a bar or pitman, G, the saw moving in slides on a frame, H, pivoted to the upright at I. The weight of this frame aids in the action of the saw. When the log, E, is to be moved for taking another cut, the lever, J, having a hook attached, engaging with a pin on the frame, H, is used to support the frame. On the frame, H, is pivoted another frame, K, carrying struts, L, for grasping the log, to prevent its rolling while being sawed.

From this description the operation of the machine will be readily understood.



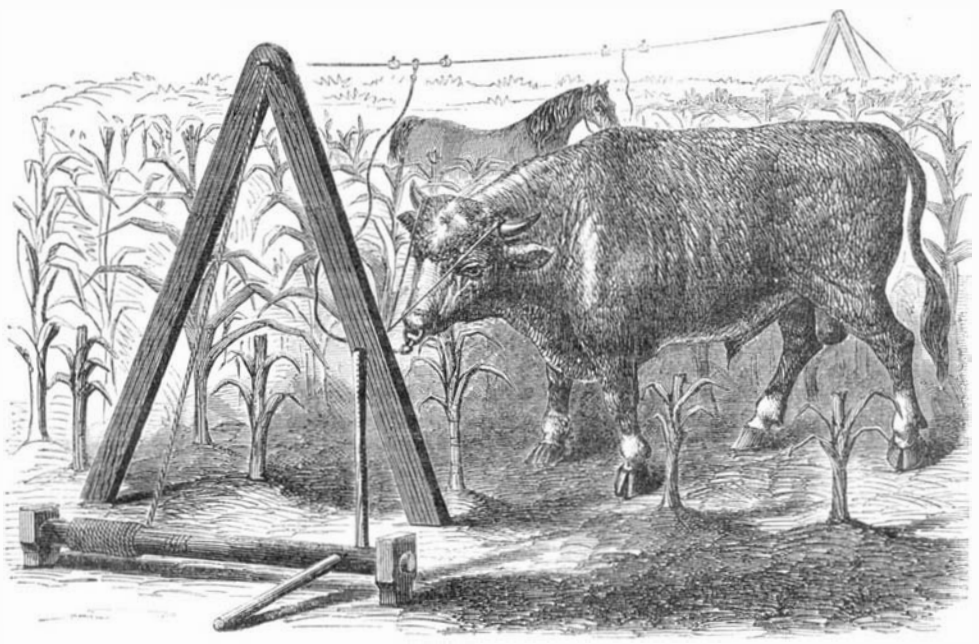
NOEL'S PATENT SAWING MACHINE.

Patented through the Scientific American Patent Agency, Aug. 25, 1868, by M. P. Noel, whom address for further particulars at St. Cloud, Stearns Co., Minn.

Device for Feeding Cattle on Growing Crops.

It is sometimes very desirable to feed crops while growing, thereby saving the labor of cutting and gathering, but if stock is turned into a field loosely, without control or guide, a large portion of the crop is destroyed by trampling. Beside this, the straying of the cattle and the trouble of collecting them when needed, are serious annoyances, demanding some device for controlling the animals while allowing them sufficient freedom for grazing or cropping. Sometimes, also, it is desirable to confine the cattle to a certain space or portion of the field, and the common method of securing the animal to a tether fastened to a stake, however feasible on grass land, is very destructive in growing corn, millet, etc.

The device shown in the accompanying engraving prevents all these annoyances and enables the farmer to govern his stock. As will be seen, the contrivance is very simple; a rope stretched between trestles, one end of the line fastened to a stake driven into the ground or to any fixture, and the other end secured to a simple windlass by which the line is made taut. The tension of the line holds the trestles at either end in an upright position without the necessity of sinking their feet into the ground. On the line, at such intervals as are required to govern the range of the animals, are snugs fastened with set screws. The animals are secured to the rope by tethers, one end of which is attached to the stretched line by a snap loop or a ring, and the other end to the neck, horns, or nose of the animal, in the latter case a snap ring engaging with the cartilage of the nose. If necessary, guide cords may be attached to the ring and the horns of the animal, as seen in the figure of the bull, to afford comfort to the animal while feeding.



WILKINSON'S PATENT CATTLE HERDER.

For herding cattle, mules, sheep, or swine, facility of leading them to water, preventing hampering, and giving entire control over them, this device is evidently valuable. With its use much of the trouble and expense of fencing will be avoided, and stock may be grazed or fed on open commons, or in fields of growing crops, without danger or annoyance. We cordially commend this simple contrivance to the attention of our agricultural readers. It was patented by Jesse Wilkinson, June 2, 1860, who, if addressed at Champaign, Champaign Co., Ill., will give any further information desired.

PROPELLING BOATS ON CANALS.

From a correspondent we have received copies of articles published in Rochester (N. Y.) papers, relative to the performances of a canal boat named the *Edward Backus*, from its builder, or rather the inventor of a new method of propelling boats, which it seems from published reports has been tried with at least present success. Instead of a side-wheel boat or an ordinary propeller, or, indeed, any boat propelled by paddles acting on the water, this is a sub-aqueous traction machine, finding its means of propulsion on the bed of the canal and by its traction wheel. We cannot do better, without diagrams or other engraved illustrations, than to copy the following attempted description from the Rochester *Daily Democrat:*

"A ten horse-power boiler and double engines are placed amidships; and by these are driven an eight-feet traction wheel, which runs in what is called a 'well,' the bottom of which is the bottom of the canal. This wheel has a facing of iron, through the center of which runs a chain acting upon it like a belt upon a pulley. This chain passes around a smaller wheel on the main shaft. On the surface of the wheel are spurs or clogs projecting about four inches from its surface and about four inches in width, and these with every revolution of the wheel, digging into the bottom of the canal, force the boat through the water. By means of a contrivance attached to the wheel, it rises and falls as the inequalities on the bottom of the canal may demand. In addition to the wheel, a four-feet propeller is also in the boat, to be used when she is required to go into deep water."

The statement does not give the amount of the rise and fall that may be imparted to the wheel to meet the inequalities of the bottom of the canal. Probably it is not much; for we are told that a propeller is used for deep water. The Rochester *Union and Advertiser* says that a propeller wheel at the stern "may be lowered in a moment to its place." One would be apt to inquire whether it would be necessary to grade the bottoms of canals as we do the level of railways or common roads, in order that this contrivance should work, and if so, whether the action of the spur wheel would not soon change the level by continually stirring up the sand and mud. The varying nature of the bed—mud, sand, gravel, etc.—and the inequalities of its surface—alternate hills and hollows—would seem to suggest that fully as much reliance should be placed on the propeller at the stern as on the amidships traction wheel. The Rochester *Democrat* says: "With two hundred tuns of coal the boat moved along at the rate of two miles an hour." This rate hardly proves the superiority of this mode of propulsion over that of horses on the score of speed. We would gladly chronicle any successful effort at improving the speed of canal navigation, but we do not recognize it in the description before us of the traction wheel boat. Still, as we before hinted, diagrams or drawings might change the complexion of the case.

Progress in Science---Something to Think About.

At the close of the ceremony of "capping" the medical graduates of the University of Edinburgh, Sir James Y. Simpson, one of the most celebrated physicians of Europe, delivered an address, in the course of which he said:

"A most extensive field for new investigations lies temptingly open for the young and ambitious physician in the almost innumerable series of new chemical compounds which modern organic chemistry has evolved. Among this world of new compounds will probably be yet detected therapeutic agents more direct, more swift, and yet more sure in their action than any which our present pharmacopeias can boast of. It may be, also, that the day will yet come when our patients will be asked to breathe or inspire most of their drugs instead of swallowing them; or at least when they will be changed into pleasant beverages instead of disgusting drafts and powders, boluses and pills. But that day of revolution will not probably be fully realized until those distant days when physicians—a century or two hence—shall be familiar with the chemistry of most diseases; when they shall know the exact organic poisons that produce them, with all their exact antidotes and eliminatories; when they shall look upon the cure of some maladies as simply a series of chemical problems and formulas; when they shall melt down all calculi, necrosed bones, etc., chemically, and not remove them by surgical operations; when the bleeding in amputations and other wounds shall be stemmed, not by septic ligatures or stupid needles, but by the simple application of hemastatic gases or washes; when the few wounds then required in surgery shall be swiftly and immediately healed by the first intention; when medical men shall be able to stay the ravages of tubercle, blot out fevers and inflammations, avert and melt down morbid growths, cure cancer, destroy all morbific organic germs and ferments, annul the deadly influences of malaria and contagions, and by these and various other means markedly lengthen out the average duration of human life; when our hygienic condition and laws shall have been changed by State legislation, so as to forbid all communicable diseases from being communicated, and remove all causes of sickness that are removable; when the rapidly increasing length of human life shall begin to fulfill that ancient prophecy, 'the child shall die an hundred years old;' when there shall have been achieved, too, advances in other walks of life far beyond our present state of progress; when houses shall be built and many other kinds of work performed by machinery, and not by human hands alone; when the crops in these islands shall be increased five or ten fold, and abundance of human food be provided for our increased population by our fields being irrigated by that organic waste refuse of our towns which we now recklessly run off into our rivers and seas; when man shall have invented means of calling down rain at will; when he shall have gained cheaper and better motive powers than steam; when he shall travel from continent to continent by submarine railways, or by flying and ballooning through the air; and when—to venture on only one illustration more—tiresome graduation addresses shall no longer require to be written by old professors nor listened to by young physicians."

PATENTS.—If success is the test of merit, we invite inventors to consider the fact that of the list of patents published in our last number, SEVENTY-FIVE were solicited through the Scientific American Patent Agency. The Patent Office, under the management of Commissioner Foote, is getting into fine working order, and applications will be more promptly examined and disposed of than heretofore. Inventors who desire advice and assistance in procuring their patents can receive our Pamphlet of Instructions and correspond with us freely.

AT Granby, Mass., in the yard at the residence formerly owned by the late Rev. Elijah Gridley, there is a fine elm tree of a century's growth. Upon the side of this tree, twelve feet from the ground, is a currant bush rooted in the bark which has thrived and produced its annual crop for years.

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VOL. XIX., No. 13...[NEW SERIES.]....*Twenty-third Year.*

NEW YORK, WEDNESDAY, SEPTEMBER 23, 1868.

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MECHANICAL SKILL NOT ALWAYS ARTISTICAL TASTE.

We have frequently spoken of the value of the mechanical skill gained by close attention to, and constant practice in different branches of the mechanical arts, especially those in which manual labor enters largely as an element; and its value cannot be over-estimated. The skill that constitutes the value of a workman can be obtained only by close application and constant practice. Such skill is the workman's capital. With it he can command, if not control the market. He can make his own terms, if not ruinously exorbitant in his demands. In almost any condition of business he can secure a good position, while loud-mouthed and conceited pretenders are "sent to Coventry." The world needs—the mechanical world demands—skilled labor, the skill that springs from an innate inclination for the business, and is obtained by close practice, and, possibly, long experience.

These remarks do not apply only to manual mechanics, but also to employments only partly mechanical in their operation; for the mind or the "groove of thought" in which it moves, is also to be educated by practice, and made subjective by experience before success is thoroughly assured. Even the entry or copying clerk, the freight agent, etc., can make himself almost indispensable to his employer by a close attention to the details of his business, and a perfect familiarity with its forms.

In this office (the patent department) we have some men who, on a mere glance at a model or drawing, form an idea, generally correct, as to its value—its patentable worth. On a further examination they give an opinion, which is not often at fault. The experience of many years—their thoughts always directed in the same channel—makes them experts. Their advice is valuable, and not unfrequently our customers receive ideas and suggestions from this source which prove to be of great assistance to them. Long experience, good judgment, educated discrimination, and the mental skill dependent on experience and practice, combine to produce this result.

But there is a perfection of skill which no mere practice can give. It is the skill of taste—the instinct, if so it may be called, that comprehends the "eternal fitness of things"—that pushes rather than leads its possessor to marked excellence. It is a natural aptness for his chosen profession, a love for its details as well as an instinctive grasping of its principles. Perhaps all are not blessed with this natural fitness for their business; many round pegs try to fit square holes. Possibly it is not easy, always, to ascertain one's peculiar bent; and, possibly, some have no peculiar taste for any particular calling. Sometimes such are so versatile that they can succeed in anything they undertake; we have known such. Yet the taste that makes a Doré in art, a Roebling in engineering, a Smith in mechanics, is a fortune to its possessor, and a benefit to the world.

Our pages not unfrequently exhibit evidences of this natural skill of taste. Everyone who has compared the illustrations in the SCIENTIFIC AMERICAN, with those in other native or foreign illustrated publications, must have noticed the excellence of our engravings. An instance appears in our last issue, where a plain photograph of a simple animal trap, as it appeared on the table of the photographist, becomes a picture, full of expression, and very suggestive. See, in the faces of the rats, and even in their attitudes, the almost human expressions of curiosity, contemplation, resolution, and, finally, despair. These representations of mental exercise and emotion, and the *character* given to our illustrations generally, are due to the taste and skill of our artists, Mr. Louis Seitz, and Mr. Henry E. Mead, and the careful manipulation of our engraver, Mr. Richard Ten Eyck, who are unexcelled in their specialties in this or other countries. Such skill rises to the hight of real genius.

We make no apology for selecting the works of our artists and engravers to illustrate the text of this article. The position of this journal does not need the perpetual blowing of our own trumpet, nor a continual reproduction of the commendations of others; else we might fill columns weekly with notices of the most favorable character. Still, it is not improper that we should refer to our corps of artists and engravers with a degree of pride, in view of the superiority of their productions. We propose, always, to employ the best procurable talent in every department. Our past success and present status prove that our discrimination between mere manual skill and natural talent is wisdom in its highest, its successful sense.

These illustrations, conveniently drawn from our daily surroundings, serve to show, in a degree, the advantage of natural bent over mere practical skill without the taste necessary to guide. In one case (the latter) perfection is attained only by continuous practice; in the other the taste of the workman eliminates crudities, perfects suggestions, and makes a merely mechanical task a labor of love. While machines, human and mechanical, can follow a plainly marked path, it is only the judgment, the instinct, the genius of the artist, in the truest sense of the term, that can make the dry bones of mechanical practice assume muscle, flesh, form, and become living representations of living ideas. Mechanical skill and constant practice can represent, either by writing, drawing, or painting, a dog, in his outlines and profile; but it requires artistic taste to reproduce the original so as to project an image of the dog on the retina of the natural eye, and at the same time convey to the mind the characteristics of the animal itself. If this is true in the representations of natural objects, appealing mainly to the eye, it is no less true of the images which appeal to the mental vision. Ideas conveyed by words alone may be either skeletons, or, perhaps, statues, or may be made living, breathing existences; one of these is the result of the skill obtained by persistent practice, and the other the skill or finish belonging only to natural taste, inclination, or genius.

PRETENTIOUS TEACHERS.

If it were not amusing it would be disgusting to witness the airs assumed by some who pretend to teach us how to preserve our health. Is there any fruit, vegetable, or meat, or drink, particularly pleasant to the palate and satisfying to the stomach, these teachers discover in it not only the seeds of death, but a fatal if not a rapid poison. Knowing something of the wants, needs, weaknesses, and frailties of "poor human nature," from our own experience, we always doubt the sincerity of those teachers who would make all men and women mere machines, to eat, drink, sleep, bathe, and dress by one rule and system. They construct a Procrustean bed for others to lie upon, but we doubt if they ever stretch their own limbs upon it. Their "best holt" is in running a tilt against everything for the stomach or palate that is tasty, nice, and gratifying. Condiments that give piquancy to otherwise tasteless dishes are their especial abhorrence.

With all proper deference to these learned teachers who preface their names with Prof., or tail them with M. D., we believe what we know—what experience has taught us—rather than accept their *ex cathedra* opinions. We believe that lemonade with sugar is better every way than without; that soda water is not unhealthful. Shall we discard sugar, and the effervescing water charged with carbonic acid gas, because somebody, assuming to teach, says these are unhealthy? Even "pure and sparkling water," drawn from nature's own fountain, the drink prepared for man by his Creator, not unfrequently holds a portion of this gas, and it is found in every sort of drink that has any "snap" to it; in in cider, root, or spruce beer, mineral waters, sparkling wines, etc.

If onions are distasteful to some persons, should others not eat them? A lover of this delicious vegetable may deny himself the pleasure of eating them from a desire not to offend the fastidious olfactories of those with whom he comes in contact; but it is not necessary to insult his common sense by telling him they are acrid and difficult of digestion; for perhaps his experience of twenty years proves the contrary.

The cholera seasons of '53–4–5 were hard on cucumber growers and eaters. Hundreds seemed to believe that almost certain death lurked within the rind of the deliciously cooling vegetable, and it was not found upon their tables. Cucumber and cholera were synonymous or convertible terms. Yet we have had this grateful vegetable on our table for parents and children to freely eat, and have always, since our earliest remembrance, eaten freely of fresh cucumbers, morning, noon, and—night, without even inconvenience, not to mention cholera or colic. This much abused vegetable is a staple article of food to the fellahs of Egypt in its season; indeed, for months they eat scarce anything else. It is as much a necessity to them as the watermelon to the negroes of the South. Yet our health teachers think cucumbers are barely allowable for healthy stomachs, and advise their elaborate preparation for the table, ending the recipe by the exceedingly witty *finale*, "throw them out of the window."

Reason would seem to teach that the sense of taste, so delightful to gratify, was given by our Creator for our pleasure; yet the main aim of our health teachers seems to be utility—ascertaining what sort of food is the cheapest—and they compile long tables of chemical statistics to prove that a peck of beans is better than a quarter of beef, that oatmeal porridge is to be preferred to a saddle of mutton; that poultry is vanity, and potatoes a costly luxury.

Children need to be guided in choice and quantity of food, and in the proper care of their persons; but if one has arrived at manhood or womanhood, without having ascertained what he should eat and drink, and what he should refrain from, there is little hope of his improving by the advice of others. What is sauce for the goose is *not* always sauce for the gander. There are individual differences in natural constitution, habits, etc., that render abortive any attempt to dictate strict rules universally applicable. Peter received a lesson (*vide* Acts, chap. x.,) which our health teachers would do well to heed. There is a great deal of force in the advice given by an old Scotch divine. He told his people, "that if they wished to enjoy religion, they must fear God, and keep their bowels open."

ARE THE DIRECT RAYS OF THE SUN HEALTHY?

Much is said about the healthful influence of the sun's rays, his heat and light, and we are advised to admit this heat and light into our houses; all of which we heartily approve. The sun is the great source of health as well as of heat, and his rays undoubtedly produce a beneficial effect upon all organisms, animal and vegetable. But it may he questioned whether the direct influence of the sun is healthful. The Sepoy campaign in India severely tested the endurance of native as well as English troops, and it was found necessary to adopt coverings of white cotton or linen for the men's caps, which, from the general use of them in Havelock's army, got their name from him, and in the early stages of our recent civil war the havelock was considered a necessary part of a soldier's fit-out. The great objection to their use was the curtain, which covering the ear, prevented the ready hearing of an order. Especially was this noticeable on a parade when the execution of an order delivered by the adjutant or the colonel of a regiment would be delayed until it could be passed from company to company in the regiment. We discarded the havelock and substituted the dampened towel, or a wisp of grass, or a handful of green leaves worn in the cap. All this simply to guard against the direct force of the sun's rays.

In New York City—in every city and town—this summer and that of 1866, men dropped fainting and sometimes dead from direct solar influence. Sunstroke the last season was a most prolific cause of death, and temporary, if not permanent, insanity. It required the coolest state of the blood, the quietest condition of the emotions, and the least bodily exertion to bear up against the injurious influences of the sun. People shunned the street and hived in their dwellings, offices, and stores to escape the evil influence, which was not only a threat and warning, but a destroyer, seldom giving the warning.

Our experience and the experience of others seems to show that sea sickness is more prevalent in the summer—on sunshiny days—than in cold weather or on cloudy days. Persons exposed in an open boat, as fishing parties, become sick and experience nausea, when those on a large vessel, where the passengers can shelter themselves from the sun's rays, may not feel the slightest inconvenience. All of this cannot be justly attributed to the tossing of the smaller vessel, as not unfrequently the rolling of a large ship is more trying to the landsman's stomach than the uneasy and erratic pitching of a small boat. In neither case do broad brimmed hats and bonnets protect from either glare or heat of the sun's rays, as the moving ocean is a mirror with a thousand concave lens, conveying the rays to *foci*, intensifying the light and heat, and, in spite of sheltering hat brims, throwing the glare and glancing the heat from the surface of the water.

Protection against the enervating effect of the sun's rays, is best afforded by the turban, which the Orientals have used for centuries—it being, in fact, the oldest headdress known—and seldom do these children of the sunny East experience the torments or meet the fatality of our two well known *coup de soliel*.

MANUFACTURE OF PLUGS AND BUNGS.

A few weeks ago, on a trip to Lowell, Massachusetts, we visited the plug and bung manufactory of A. Bachelder, and witnessed the operation of an automatic machine for turning plugs and bungs. By the old style a series of cylindrical saws, corresponding in their interior diameter with the required diameter of the bung, were used, or a series of knives fixed to a cylinder, but they were difficult and expensive to make, and troublesome to keep in order; beside, they did not furnish a finished article. The one in use at this establishment has a cylindrical saw set at an angle to the ways of the machine, and on the other side is an automatic cutter, like a turning chisel or plane-bit, for finishing the plug. The pieces to be turned are sawed off squared sticks, the diameter of the stick corresponding with the required diameter of the plug, and the pieces cut to the right length. These blocks are fed into an upright hopper so proportioned as to deliver them properly at the bottom to two automatic, revolving centers, when they are brought under the action of the cylinder saw which cuts off the corners of the blocks and reduces them to a cylindrical form. Soon as this is done, and before the block is released, a sharp blade rises up and traverses the length of the block, producing a perfectly smooth surface and a slightly tapering form. The action of the parts is perfect and the rapidity of the production wonderful. A boy can tend a machine, the only labor necessary being to feed the sawed blocks, and that might be arranged to operate automatically. The preparation of the blocks is simply the sawing of the stock into strips and the cutting of them

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to the proper length. These plugs are made of pine, spruce, oak, etc., for bungs for barrels for holding flour, oils, spirits, beer, molasses, tar, and as plugs for shipbuilding, for the use of inspectors, and many other purposes.

The Limit of Human Thought.

In No. 12 of the present volume we published an article entitled "Progress of Chemical Science," in which we endeavored to show that there is an ultimatum in physical science which the human mind can never reach. The following extract from the address of Prof. Tyndall to the British Association, in August, so strikingly confirms the views we expressed in the article referred to that we make room for it in our present issue :

In affirming that the growth of the body is mechanical, and that thought, as exercised by us, has its correlative in the physics of the brain, I think the position of the materialist is stated as far as that position is a tenable one I think the materialist will be able finally to maintain this position against all attacks; but I do not think, as the human mind is at present constituted, that he can pass beyond it. I do not think he is entitled to say that his molecular groupings and his molecular motions explain everything. In reality they explain nothing. The utmost he can affirm is the association of two classes of phenomena of whose real bond of union he is in absolute ignorance. The problem of the connection of body and soul is as insoluble in its modern form as it was in the pre-scientific ages. Phosphorus is known to enter the composition of the human brain, and a courageous writer has exclaimed, in his trenchant German, "*Ohne phosphor kein gedanke.*" That may or may not be the case: but even if we knew it to be the case, the knowledge would not lighten our darkness. On both sides of the zone here assigned to the materialist he is equally helpless. If you ask him whence is this "matter" of which we have been discoursing, who or what divided it into molecules, who or what impressed upon them this necessity of running into organic forms, he has no answer. Science also is mute in reply to these questions. But if the materialist is confounded, and science rendered dumb, who else is entitled to answer? To whom has the secret been revealed? Let us lower our heads and acknowledge our ignorance, one and all. Perhaps the mystery may resolve itself into knowledge at some future day. The process of things upon this earth has been one of amelioration. It is a long way from the Iguanodon and his contemporaries to the president and members of the British Association. And whether we regard the improvement from the scientific or from the theological point of view, as the result of progressive development, or as the result of successive exhibitions of creative energy, neither view entitles us to assume that man's present faculties end the series—that the process of amelioration stops at him. A time may therefore come when this ultra-scientific region by which we are now enfolded may offer itself to terrestrial, it not to human investigation. Two thirds of the rays emitted by the sun fail to arouse in the eye the sense of vision. The rays exist, but the visual organ requisite for their translation into light does not exist. And so from this region of darkness and mystery which surrounds us, rays may now be darting which require but the development of the proper intellectual organs to translate them into knowledge, as far surpassing ours, as ours does that of the wallowing reptiles which once held possession of this planet. Meanwhile the mystery is not without its uses. It certainly may be made a power in the human soul; but it is a power which has feeling, not knowledge, for its base. It may be, and will be, and we hope is turned to account, both in steadying and strengthening the intellect, and in rescuing man from that littleness to which, in the struggle for existence or for precedence in the world, he is continually prone.

The Manufacture and Keeping of Cider.

The following extract from the "Wine-makers Manual," noticed in a previous number, will be of interest now that the season for cider-making is about to commence:

Cider is made by mashing and pressing ripe apples. A good eating apple is not necessarily a good cider apple, though there are good cider apples that are also good eating apples; for instance, the Romanites, russets, etc. The best cider apple is the crab apple. As stated, the juice is transferred to barrels as soon as pressed, and there permitted to ferment. The fermentation does not come as quick as in grapes, and proceeds generally a little slower. The saccharine matter showing but thirteen degrees, and often less, much less alcohol is generated, and acetous formation is much more likely.

Pure cider is a cooling, slightly alcoholic, tartish beverage. It may be much improved by using five to ten pounds of starch sugar to fifteen gallons of juice, or, if that be unattainable, common sugar of the same weight, to each fifteen gallons of juice, before fermentation. The amount of sugar depends on the weight on the saccharometer. Cider that weighs thirteen, needs but five pounds; that which weighs nine or less, needs ten or more.

Boiling one barrel down to half, and mixing it with another barrel, thus making one and a half barrels of juice, is also a very good method, and boiling all down so as to bring the "must" to twenty and more degrees on the saccharometer, is also to be recommended; though I should think it handier for our households to condense one half to twenty-five, or even higher, density, and then pour it into the remainder. There are very few farms on which there may not be made six barrels of apple "must." By condensing three barrels into one, and pouring this condensed barrel of juice into the three other barrels of common cider, fermenting all in one cask, the farmer would secure four barrels, or one hundred and sixty gallons of excellent house wine, which would keep the whole year in the darker and cooler parts of most of our cellars. Care should be had to sulphurize the vacant part of the cask out of which the cider is being drawn off for house use. Better still would it be to draw it off, late in the spring, into about seven hundred bottles (involving a cost of about forty dollars for bottles), after it is fermented and has become clear. The receipt for making sweet cider with sulphite of lime, can be had at the druggists.

Editorial Summary.

THE parade of the United Order of American Mechanics, took place at Lancaster, Pa., on the 11th inst.. and was a large civic demonstration, and altogether a very interesting occasion. About fifty councils from this State were represented and several from Delaware and New Jersey. Upward of five thousand men were in line. Some twenty large wagons were also in line, on which carpenters, bricklayers, saddlers, coopers, carriage-makers, boiler makers, house carpenters, printers, blacksmiths, and tinsmiths plied their profession. On one wagon were thirteen young women, dressed in white to represent the original thirteen States. In the center of these was a young woman personating the Goddess of Liberty. The wagon was drawn by thirteen gray horses. This was followed by General Washington on horseback, accompanied by a footman. A miniature steam fire-engine, electric telegraph, sewing machines, grain drills, and grain fans were also represented.

DETECTION OF NITRO GLYCERIN.—To detect nitro glycerin in cases of poisoning, one should proceed in the following manner: The organic material to be tested is extracted with ether or chloroform, the extraction mixed on a watch glass with two or three drops of pure aniline, and evaporated upon the water bath. A few drops of concentrated sulphuric acid are then added, when, if nitro glycerin is present, a purple coloration appears which changes to a dark green on dilution with water. As little as ·001 grain of nitro glycerin may thus be identified.

THE ASTRONOMERS IN LUCK.—Telegrams reporting the complete success of various expeditions sent to observe the recent total eclipse of the sun have been received. It is announced that the German expedition to Aden, in Arabia, is bringing six photographic views of the eclipse, while others announce the results of spectroscopic observations as being of the most remarkable character. We await with eagerness the full details of the observations.

WE regret to announce the total destruction by fire of the extensive billiard table manufactory of Phelan & Collender, situated on Thirty seventh street. There were employed in the building some four hundred and ten men, who will thus be thrown out of work. The loss is not known, but with the three hundred finished tables, and four hundred more in process of construction in the building, it cannot, with these alone, be less than $175,000.

AUSTRALIA is beginning to look after her manufacturing interests. A paper mill has been started at Melbourne, and it is announced with something of an air of triumph, that it makes paper good enough to print on! A woolen factory lately constructed at Geelong, sold $15 000 of goods at the first sale; and the citizens were so pleased at the result, that ninety of them ordered a suit of the native cloth, for their own wear.

A FEW days since, while some persons were walking upon the side of the bluffs in the rear of La Crosse, a singular subterraneous sound was heard, which proved upon investigation, to proceed from a large underground stream of pure water running only three feet below the surface of the rocks, The stream is said to be ample for the supply of the city.

THE upper portion of the bottom land along the Missouri river is stated to be covered with the sunflower, the result of seeds scattered by the Mormon emigrants. Although these seeds are known to contain a valuable oil, no one has as yet taken advantage of this large natural crop, and it is annually wasted.

ENGLISH railroad companies may well be cautious in their management if such verdicts as the following are the rule. The family of a Mr. Howard, killed on the Great India Peninsula Railway, has been recently awarded damages amounting to $58,750. How would such verdicts suit our American railway companies?

GRANT OF BOOKS FROM THE BRITISH GOVERNMENT.—In virtue of a grant from the British Government, Cornell University, Ithaca, N. Y., is to receive a complete set of the British Patent Office publications, consisting of more than 2,300 volumes, and also such books as shall hereafter be printed in continuation of the set.

S. W. BLOOM, of Bromstown, Ind., has made from common cornstalks, a sirup superior in flavor to sorghum, though there was a sorghum flavor discernible. The yield is nearly equal, per acre, to that of sorghum, and does not interfere with the production of green corn for market, from the same stalk.

It is reported that a new fire-arm has been invented and exhibited at Köenigsburg, Prussia, having thirty-seven barrels. From 222 to 333 shots per minute can be made with it, and the balls carry 1,500 yards. It is used with a rest, and operated by one man, the recoil being taken up by a powerful spring.

AN organ is now being built in London for Christ Church Camberwell, which is to have its keyboard placed fifty feet away from the body of the instrument. Instead of wooden trackers conducting wires will be used, and the instrument will be played by electrical agency, in the same way as a telegraphic machine may be worked by an operator at a distance.

THE London *Lancet* says toothache can be cured by the following preparation of carbolic acid: To one drachm of collodion add two drachms of Calvert's carbolic acid. A gelatinous mass is precipitated, a small portion of which, inserted in the cavity of an aching tooth, invariably gives immediate relief.

IT was proposed to give the Chinese an American watch, but as the Chinese day consists of only twelve hours, an ingenious Yankee has undertaken to manufacture a watch adapted to both the Chinese system and the one used in Europe and America.

A DETROIT editor has invented an advertising bell to be attached to bulletin boards, walls, fences, and so forth, to attract attention to the advertisements pasted thereon. It is operated by a coiled spring with clockwork gearing, and when wound up and set running it will sound at intervals of a few seconds continuously for a week if desired.

A SENSATION was created at Niagara Falls recently. The main wires of the new suspension bridge have been thrown across the river. Two laborers walked the lower one from bank to bank, steadying themselves by the upper one, the wind meanwhile blowing furiously and swaying the wires in a frightful manner.

THE fires in the forests on the upper Ottawa, and Gotineau rivers in Canada are the most disastrous that have occurred on this continent, the loss being already estimated by millions of dollars. Some plan ought to be adopted to prevent the criminal carelessness in which such fires generally have their origin.

IT is rumored that a movement is on foot to unite the United States, England, and Russia in a grand expedition to solve the problem of the North Pole and its surroundings. Something of the kind ought to be done, in order to freeze off a few more adventurers.

LOUIS NAPOLEON is said to be mindful of the interests of his old friends. One of these, a bankrupt in 1850, has by the Emperor's aid amassed $20,000,000, while many others are said to have been placed on the track of large fortunes by his advice and assistance.

ANY one who proposes to advertise in a paper has a right to know its circulation. The mere printing of a notice is of no value unless somebody reads it. The SCIENTIFIC AMERICAN has more readers than any other journal of its class in existence.

IT is said that Mr Emerson considers the writing of twenty lines, completely finished and creditable to himself, a fair day's work. Some have thought that to read and understand twenty lines of his writings was a sufficient day's work for his readers.

THE proper hight of turning tools on a lathe is a matter of importance to machinists. Many a job and many tools have been ruined by want of the knowledge in this respect gained only by experience.

IT is said that velocipedes are to be adopted for the use of mail carriers in suburban districts, which it is estimated will enable them to complete their rounds four hours earlier and with less fatigue than is now the case.

THE Museum of the Academy of Sciences in Philadelphia is now receiving eight large meteoric stones, weighing together 3,000 lbs., discovered in the Mexican mountains by Dr. H. B. Butcher, of that city.

A SOUTHERNER proposes to supply the Boston market with paper stock made from the cane of the Florida cane brakes. He has invented a machine for reducing it to fiber which he affirms can be sold in Boston for two cents per pound.

TWISTING or turning of belts is a poor makeshift when a straight belt refuses from slackness to perform its office. Better take up the belt and allow it to perform its proper office.

A WATCHMAKER of Paris has just completed a watch for the Sultan, valued at one million francs. There is a diamond at the back nearly as large as a walnut.

JOHN JENNESS, of Craftsbury, has in his possession a pair of oak cartwheels, made during the Revolutionary war, still quite sound and capable of service.

THE circulation of the SCIENTIFIC AMERICAN was never greater than now. As an advertising medium it has no equal in its specialty.

THE early frosts experienced in New England call to mind the severe frosts that occurred in August, 1816, by which the corn crop was nearly destroyed.

A WESTERN editor has adopted the plan of sending to subscribers long in arrears very damp papers, as a gentle hint that there is much *due* on them.

IT is said that an innkeeper at Schaffhausen, on the Rhine, has suspended in a frame a board bill which the Emperor Louis Napoleon has owed him for thirty-nine years.

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Platinized Mirrors.

The diathermanous, properties possessed by various substances are precisely analogous to those of transparency and translucency with which they are endowed, except that the former refer to rays of heat and the latter to those of light. Although in some degree the two descriptions of rays may be confounded, yet they are in reality separate, and the actinic rays of the sun are perfectly distinct from his luminous ones.

It might be supposed that the substance which showed great power of translucency would also evince similar capabilities with respect to diathermanancy, but experience has proved this assumption to be perfectly erroneous. If we select chloride of sodium in its crude condition, common crystal, and alum, they will be found nearly all equal in their power of transmitting light, but a wide discrepancy will be found in the manner in which they transmit heat. Their diathermanous capabilities are in the proportion of 9, 62, 93. It is quite possible to modify these proportions of bodies so as to produce quite contradictory and almost apparent paradoxical results. Thus a mirror can transmit light, and a perfectly translucent surface is capable, under certain conditions, of reflecting it. We really know the imponderable elements by their effects alone, and in spite of many learned surmises and ingenious theories of their origin and nature, we are as much in the dark as ever respecting their true cause and character. The effect of platinum upon glass, and the modification it produces upon its optical properties, has been turned to account by M. Dodé some time ago. He takes an ordinary plate of glass, and by a chemically mechanical operation coats it upon one side with an almost infinitely thin layer of platinum. By this plan he obtains a mirror with direct reflection, and which may also, curiously enough, be employed as a common window pane by turning the coated surface outside. A slight tinge is imparted to the objects beheld through this medium, but otherwise the vision is clear, and the outlines of the objects well defined.

As all rays of light and heat must be disposed of by reflection, absorption, and transmission in different proportions, it is manifest that when a transmission and absorption accompanies a reflection, there is a loss incurred when the end in view is to bring into play the reflective powers only of the body. To prevent this, it is the practice to cover the non-platinized surface of the mirror with a slight coating of varnish. In this condition they are, of course, not translucent, but when they are intended to be manufactured in the form of kitchen and domestic utensils the varnish is omitted. They are, moreover, covered with a variety of designs, produced by corroding the surface of the glass and platinizing the engraved portions, which, therefore, are rendered alone transparent. Very beautiful and elaborate designs can be produced in this manner. One of the distinguishing features characterizing the light transmitted by glasses platinized in the manner described, is its peculiar softness and tone. M. Leroux was the first to notice this particular attribute of the light, and stated that it might be turned to good service in shielding the vision when engaged in regarding any intense source of heat, such as the sun, smelting, or gas furnaces When the natural sight is weak or temporarily deranged, these platinized glasses might be advantageously substituted for the tinted or colored ones usually employed, which are supposed to possess powers of neutralization that in reality rarely belong to them. They have already been replaced by the former in some astronomical instruments, to modify the intensity of the solar rays. All that is necessary is to place one of the glasses before the object-glass of the telescope, by which means a large proportion of the rays are reflected, and only a number pass through sufficient to enable the observer to study the aspect of the luminous body, without fatigue or annoyance to the eye. This property of subduing and softening rays of ardent light is not confined solely to platinized glass. The same effect is produced by the application of different metallic substances. If a pale blue glass be simply covered with a piece of gold leaf, the light transmitted is instantly endowed with a peculiar soft tone. A slight characteristic tint is also imparted to the light, which depends upon the nature of the metal employed. Thus, if pure gold be used, the tint is of a light greenish hue, while the ordinary or jeweler's gold, which always contains a certain proportion of silver, gives a bluish shade, varying in depth of color with the amount of alloy in the gold. The effect of thin sheets of metallic substances upon light has been known for a long period, and M. Foucault has proposed to silver the object-glasses of telescopes employed solely for taking observations of the sun. He himself made the experiment upon the lens of a large telescope in the French Royal Observatory, and found that the image lost none of its clearness or sharpness, and the plan was greatly superior to the ordinary one of interposing a colored medium before the eye-glass of the instrument.—*Mechanics' Magazine.*

VARNISH FOR IRON WORK.—Dr. Lunge has published a method of making an excellent black varnish for iron work. he distills gas-tar until nearly all the volatile products are got rid of. He then stops the distillation and dissolves the residual pitch either in the heavier oils, or, if a very quickly drying varnish is required, in light oils or naphtha. This varnish is, of course, the original tar minus the ammonia, water, carbolic acid, and other things which give it its disagreeable odor, and make it so long in drying.

EFFECT OF FLANNEL ON THE SKIN.—Dr. Fox remarks that under the use of flannel, local heat is intensified. and itching often increased and kept up. He gives as a practical rule "whenever you have a congestive state of the skin, or any disposition to neurosis, take off the flannel and place it, if necessary, outside the linen, this will prevent any catching cold."

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office.

FOR THE WEEK ENDING SEPTEMBER 8, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat.....$10
On filing each application for a Patent, except for a design.....$15
On issuing each original Patent.....$20
On appeal to Commissioner of Patents.....$20
On application for Reissue.....$30
On application for Extension of Patent.....$50
On granting the Extension.....$50
On filing a Disclaimer.....$10
On filing application for Design (three and a half years).....$10
On filing application for Design (seven years).....$15
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81,861.—GRAIN MOISTENER.—L. J. Adams and J. H. Esale, Avon, Ill.

We claim the combination of the steam pipe or pipes, F, perforated shield, G, and drip pipe or pipes, H, with the hopper, A, substantially as herein shown and described and for the purposes set forth.

81,862.—SAFETY ATTACHMENT FOR POCKETS OF APPAREL.—Alfred Arnemann, Guttenberg, Iowa.

I claim a pocketbook protector, consisting of the wire clasp, A, and of the plate, B, spring, c, hook, d, and knob, f, all arranged and operating substantially as herein shown and described.

81,863.—STEAM SAFETY VALVE.—E. H. Ashcroft, Boston, Mass.

I claim the arrangement of the projecting jacket, d, with the cross head, C, with reference to the valve and spring, substantially as herein shown and described.

81,864.—PORTFOLIO.—G. Ashworth and E. Ashworth, Manchester, England Patented in England, March 15, 1867.

We claim the spring clips or fasteners, d, constructed and applied to a portfolio substantially as described, in combination with a band or bands, c, of leather, or other suitable material, and which are adapted to staples or binders secured to sheets to be bound, substantially as specified.

81,865.—OPERATING SHUTTLE BOXES IN LOOMS.—John Ashworth (assignor to George L. Davis, John A. Wiley, and Joseph M. Stone), North Andover Mass.

I claim, 1st, The combination of the lever, E, with the two cam wheels, H and I, arranged with and acting on said lever, at different points in its length substantially as and for the purpose set forth

2d, The combination of the lever, E, the cam, H, and its hook rod or rods for operating the same, and the cam, I, and its hook rod or rods for operating the same, with the vibrating pawl or driver, N, and the levers P, and the pattern chain, and their accessories, for controlling the movements of the shuttle boxes substantially as described.

81,866.—WATER WHEEL.—Vincent M. Baker, Preston, Minn.

I claim the chutes, IX, in combination with the sliding gates. d, operated through the medium of the ring, H, and gearing, k l, all arranged substantially as and for the purpose set forth.

81,867.—STILL.—G. O. Baldwin, Hillsborough, Ohio.

I claim the slide, D, and condenser, E, constructed as described, when used in combination with the boiler, B, and steam pipe, C, substantially as and for the purposes herein set forth.

81,868.—APPARATUS FOR RECTIFYING SPIRITS.—W. G. Barcite, Canton, Md.

I claim the combination, with the still, A, of the cylinder, B, provided with the condensing chambers, D and E, refrigerator, F, and pipes, H and I, substantially as and for the purpose described.

The arrangement of the supply pipe, G, discharge pipes, K and M, the air tupe, L, and refrigerator, F, substantially as and for the purpose described.

The receiver, O, provided with a pipe, P, communicating with the still, for returning the light wines, substantially as and for the purpose described.

The combination, with the cylinder, B, of the stop cock, R, tubes, S and worm, F, substantially as and for the purpose set for h.

81,869.—COFFEE MILL.—W. H Barns, New London, Conn.

I claim the combination and arrangement of the coiled spring, a, with the arbor of the runner, C, shell, D, and nut, b, all operating substantially as shown and described and for the purpose set forth.

81,870.—REGISTER FOR KNITTING MACHINES.—B. B. Bollinger, Louisville, Ohio.

I claim, 1st, The knitting-machine register composed of a pattern wheel, E, a spring hammer, F, and an alarm bell, substantially as and for the purpose described.

2d, In registers for knitting machines, the combination of the alarm bell, hammer, and mechanism for moving the pattern wheel, substantially as here in described.

81,871.—PRINTING TELEGRAPH INSTRUMENT.—R. K. Boyle (assignor to himself and Giuseppe Taglabue), New York city.

I claim, 1st, Arranging a pair of electro magnets on each side of two horseshoe magnets, which are fastened to an oscillating shaft, substantially as herein shown and described, so that one pole of each horseshoe shall be attracted by but one electro-magnet, for the purpose specified.

2d, The application of the adjustable springs, d d', to the stationary part of the apparatus, said springs aiding to repel the horseshoe magnet, and to adjust the same in the center of forces, substantially as herein shown and described.

3d, The insulated sleeve, f, attached to the horseshoe magnet, in combination with the slotted pillar, g, and with the wires of the local magnet, all made and operating so that when the oscillations of the horseshoe magnet will cease, the connection of the wire of the local magnet will be completed, substantially as and for the purpose herein shown and described.

4th. Connecting the local magnet, F, by means of an escapement lever, j, with the friction wheel, H, substantially as and for the purpose herein shown and described.

5th, The lever, I, when connected with the sleeve, m, in combination with the friction wheel, H, and spring, p, all made and operating substantially as herein shown and described.

6th, The device, herein shown and described, for locking the bar, n, into the toothed disk, L, by the action of the horseshoe, and subsequently of the local magnet, said device consisting of the sleeve, m, lever, I, spring, p, and friction wheel, H, the latter having upright pins, l, and all made and operating substantially as and for the purpose herein shown and described.

7th, Connecting the friction wheel, H, with the escapement levers, j and M, all made and operating substantially as and for the purpose herein shown and described.

8 h, Connecting the sleeve, m, which is operated by the action of the local magnet, F, with the sleeve, t, which is moved by the action of the horseshoe magnets, E E', substantially as herein shown and described.

9th, The device herein shown and described for winding up the hair spring, x, by which the sleeve, t, is turned, said device consisting of the cam, u, arm, w, forked bar, v, arm, c', ratchet wheel, y, and block or pin, b', all made and operating substantially as herein shown and described.

10th, Combining the horse-shoe magnet and the local magnet in such a manner with the type-wheel shaft that, by the action of the horse-shoe magnet, it receives the required motion, while, by the action of the local magnet, it is instantaneously stopped in the desired position, substantially as shown and described.

11th, The arm, N, when secured to and projecting from the shaft, J, in combination with the arm, n, which projects from the revolving and sliding sleeve, m, and which, by being locked into the stationary disk, L, also locks the shaft, J, substantially as and for the purpose herein shown and described.

12th, The type-wheel. O, when provided with a pin, h', in combination with the turning cam, P, sleeve, i', on shaft, R, pin, j', on sleeve, i', arm, T, and spring, m', all made as described, and operating in combination with each other, substantially in the manner set forth.

13th, the sliding sleeve, i', which is moved when the type-wheel shaft is stopped, and which is combined with the pin, S, having the arms, M T and U and operating the printing cushion, V, substantially as and for the purpose herein shown and described.

14th, The feed-rollers, p' p', when receiving motion from the friction wheel, H, and when combined with the support, l U, and with the printing cushion, V, all made and operating substantially as and for the purpose herein shown and described.

15th, The printing cushion, V, when pivoted to an upright pin, and when operated by a spring, o', which is secured to one of the arms of the pin, S, substantially as herein shown and described, so that it will be forced with sufficient power against the edge of the type-wheel, and will still be yielding, as set forth.

81,872.—PIANO HAMMER.—C. W. Brewer, Racine, Wis.

I claim a piano hammer, constructed substantially as and for the purpose set forth.

81,873.—RAILROAD CAR HEATER.—Hiram M. Britton (assignor to himself and Joel F. Richardson), Cincinnati, Ohio. Antedated March 9, 1868.

I claim the relative arrangement within the car, A, of the hot-air chamber, G, having double metallic walls, C E, and the furnace, D d d, the induction pipes, H, conducting pipes, I I' M N, and fan, J, substantially as and for the purpose set forth.

81,874.—SILK-WINDING MACHINERY.—Henry L. Brown, Mansfield Center, Conn.

I claim the arrangement of the spools, c c', arms, d, and connecting rod, e, in a silk-winding machine, so as to produce an automatic vibratory change motion of one spool, relatively to the other, substantially as described.

81,875.—GRAIN BINDER.—Joseph K. Bull, Buckingham, Iowa.

I claim, 1st, The movable platform, B, hinged or pivoted bars, C, and cord chain, D, in combination with the frame, A, substantially as herein shown described and for the purposes set forth.

2d, The combination of the seat, E, box or trough, G, and pivoted box, I with each other, and with the movable platform, B, and frame, A, substantially as herein shown and described, and for the purpose set forth.

81,876.—MEDICAL COMPOUND.—J. H. Butts, Stroudsburg, Pa.

I claim the compound above described, composed and operating substantially as and for the purpose herein set forth.

81,877.—PESSARY.—W. F. Chrisman, Trenton, Tenn.

I claim a pessary, of the form, construction, and method of operation, substantially as shown and described.

81,878.—STEAM SAFETY VALVE.—Gilbert H. Clemens and Everett Clemens, New York city. Antedated August 28, 1868.

We claim, 1st, The arrangement of the enclosed chamber, f, with reference to the valve within said chamber, the levers, h h, and weight, k, below the same, substantially as set forth.

2d, The arrangement of the levers, h h, radially, whereby their shorter ends act directly upon the valve stem, and their longer ends sustain the weight substantially as set forth.

81,879.—PLANE.—Alfred H. Comp, Mount Joy, Pa.

I claim the beveled sliding plate, A and beveled grooved plate, B B, with their screw bearings, when constructed to operate in the manner and for the purpose specified.

81,870.—BED LOUNGE.—J. L. Cox, Manchester, N. H.

I claim the ratchet, b, and lock, x, in combination with the hinge, a, operating back, A, arm, A', with ratchet, m, arm, C, with ratchet, h, and joint, D, the several devices operating relatively to each other, as described and for the purposes specified.

81,881.—HOT-BED SASH AND FRAME.—Matthew Cridge, Allegheny City, Pa.

I claim, 1st, In a hot bed sash, the sliding rails or bars, b, constructed and used substantially as and for the purposes hereinbefore set forth.

2d, A slotted following sash bar or rail, f, which forms one side of the sash frame and which holds the other sash bars and the glass securely in position substantially as above described.

81,882.—WAGON BRAKE.—H. Davidson, New Salem, Ill.

I claim the arrangement, herein shown and described, of the brake bar, S, slotted plate, P, U-shaped levers, O H, connection, N, rod, K, formed with an eye at its rear end, bolt, G, arms, E, slotted plate, D, formed with hooks, slotted strap, F rod, C, having a hook at each end, and sliding sleeve, A, all constructed as described, and arranged with relation to the reach, Q, king bolt, M, and pole, B, to operate as set forth.

81,883.—CONSTRUCTION OF WAGON AND CARRIAGE WHEELS.—Matt J. Dawkins, Brookston, Ind.

I claim, 1st, Setting or adjusting the wheel, with the spokes inserted therein, to the tire, by means of cams cast on to a thimble, said cams being located within the hub, and their faces bearing against the spokes, substantially as described and set forth

2d, The hub, made of three parts, viz., the back part, with the main box cast in one piece, the front part, and the thimble, with cams cast thereon.

3d, The step-shaped form on the lower part of the spoke, which rests against the cams.

4th, In combination with the foregoing, the tapering sockets in the centrally divided hub, substantially as described.

81,884.—MANUFACTURE OF SOLID FATTY ACIDS.—Louis Adolphe De Milly, Paris, France.

I claim, 1st, Complete saponification, by means of sulphuric acid in the space of three minutes or less, substantially as and for the purpose set forth.

2d, Also, saponifying by means of sulphuric acid, without distillation, of the fatty acids, and without the usual deposit of carbonaceous, insoluble, tarry matter, which accompanies the existing mode of using sulphuric acid, as described in the specification.

3d, The use of water and white of egg for giving the brilliant whiteness to the candle stuff, substantially in the manner and for the purpose set forth.

4th, The due mixture of the palm and animal fat, substantially as described, for giving the crystalline structure found in this compound.

5th, While I do not claim the use of pressure to separate liquid and solid fats treated with sulphuric acid, I do claim treating this material with the succession of hot and cold pressure, substantially in the manner and for the purpose described.

81,885.—COFFIN.—Edward Ellingen, Mineral Point, Wis.

I claim the coffin, coated upon the inside with a composition impervious to moisture, as described, and rendered air-tight by the metal rubber packing, b, let into the under surface of the lid, and held in place by the metallic strip, B, as herein set forth and shown.

81,886.—MACHINE FOR SIZING AND POLISHING BRAID.—John S Fenner (assignor to the The Inman Manufacturing Company), Warren, R. I.

I claim, 1st, The arrangement of driven guide and feed rollers with a rotary brush or brushes, such rollers presenting the braid to the brush or brushes, substantially in the manner shown and described, and so that the braid in passing through the machine shall be repeatedly subjected to the action of the brush or brushes, substantially as described

2d, The arrangement of guide and tension rollers, j j' c c' d d' g g' and h h', upon opposite sides of brush drums, C D, substantially in the manner and for the purpose described.

3d, In combination with a dressing and polishing machine, mechanism, substantially as herein described, for communicating an intermittent movement to the braid, while it is being acted upon by brushes, substantially as specified.

4th, The arrangement of the weighted roller, F2, and the roller, F, with a sizing trough and drying and dressing brushes, as described.

5th, The arrangement of the guide and tension rollers, c d g, with the brushes, C D, substantially in the manner described.

6th, The combination of the reel, E, sizing trough, F, brushes, C D, guide and tension rollers, j c d g and h, and reel, E, all arranged substantially as described.

81,887.—CULINARY APPARATUS.—Joseph S. Field, Brooklyn N. Y.

I claim 1st, The apparatus for cooking by steam, when made to be one complete and inseparable vessel, having distinct compartments, for the reception of pans and dishes, each compartment provided with a door, and so arranged that they are all supplied with steam from a common boiler, by means of a side flue, having one of its walls perforated, as herein shown and described.

2d, The vessel, A, when divided, by means of partitions, B, into compartments, which are connected by means of the flue, F, with a boiler, C, each compartment provided with steam-tight doors I, and the flue, F, and boiler admitting of the passage-pipe, G, arranged as described for the purpose specified.

81,888.—STARCH SEPARATOR.—Colgate Gilbert, Buffalo, assignor to J. J. Gilbert, Little Falls, N. Y.

I claim, 1st, The method of supporting and vibrating the bolting frame, A of a starch separator, substantially as shown and described and for the purpose set forth.

2d, The method of supporting the bolting cloth, B, of a starch separator by longitudinal ribs, a a a, etc., arranged and combined substantially as shown and described and for the purpose set forth.

3d, The extensible and adjustable tube, composed of the parts, S T U V V when forming part of a starch separator, and arranged and combined to operate substantially as shown and described and for the purpose set forth.

4th, The method of adjusting the incline of a starch separator by means of screws, g, when the same are arranged in combination with the receiver, C, frame, A, and bed, G, all substantially as shown and described and for the purpose set forth.

5th, An improved starch separator, when constructed and arranged to operate substantially as shown and described and for the several purposes set forth.

81,889.—SASH FASTENER.—L. D. Gould, Newark, N. J.

I claim the combination of the bolt e, with the eccentric, a, when combined therewith, by sliding the eccentric in the manner and for the purpose shown.

81,890.—ANTI-SLIPPING PLATE.—W. B. Gould, Boston, and W. H. Harris, Taunton, Mass.

We claim a plate, provided with a device for securing it to a table, substantially as set forth.

81,891.—GRAIN BINDER.—J. B. Greenhut, Chicago, Ill.

I claim, 1st, The rake, C, constructed as described, in combination with chain, E, guide rail a, plate, D', hook, e, plate, D, pin, g', and guide, F, or their equivalent devices, the whole arranged and operating substantially as herein set forth and specified.

2d, The compresser, R, consisting of standard, W, provided with cam, y, hook, v', and plates, u and v, the compressing arms, Y Y, plates, Y' Y', and adjustable spring lever, Z, each part constructed as described, and all arranged and operating substantially as herein set forth.

3d, The regulating device, consisting of segment, M, pawl, N, adjustable plate, S, bent rod, 2, and connecting plate, q, all arranged and operating substantially as and in the manner herein described and specified.

4th, In combination with the compresser, R, the cam, H, provided with opening, 1, and flange, 1', with its pawl, 2', substantially as and for the purposes set forth.

5th, The combination of the knife, 3, fork, 4, and device, IV, and cam flanges, U', all arranged and operating substantially as set forth.

6 h, The binding device, consisting of case, A', shaft, B'', rod, H'', pin, G'', spring, h'', fingers, K'' K'', pinion, C'', head, c'', flanges, d'' d'', yoke, e'', and fork d standard, D'', or their equivalents, each and all constructed, arranged, and operating substantially as and in the manner herein described and specified.

7th, The bent lever, L'', brace, m', case, A'', and arm, 7, of the device, IV, in combination with the fingers, K'' K'', and the mechanism for operating the same, the whole constructed and arranged substantially as herein described and for the purpose set forth.

81,892.—GAS HEATER.—J. T. Greenwood, Beloit, Wis.

I claim a kerosene stove, herein described, or its equivalent, when made of wood, in combination with cold-air drafts, a a, tin lining, E, cold-air chambers, e e a a, heat deflector, d, cones, L L, tank, M, cover, M', and cooler, I, when the whole is constructed and arranged substantially as and for the purpose herein set forth.

81,893.—GLOBE VALVE.—G. D. Hadley (assignor to himself and Gardner Waters), Cincinnati, Ohio.

I claim a globe valve when constructed with a blank surface, A, above the screw, a, in the body or shell of the valve, and the corresponding blank surface, B, above the screw, b, on the stand, D, so that when the screw, b, is relieved from the screw, a, and the valve, E, is bearing upon its seat, the blank surfaces, A and B, shall form a perfect guide for the purpose of grinding the valve to its seat without being obliged to remove the handle or the packing from its stuffing box or the body of the valve from its connections.

81,894.—EXPLOSIVE COMPOUND.—Joseph Hafenegger, San Francisco, Cal.

I claim the within described explosive compounds consisting of Nos. 1 2 3 4 5, made of the ingredients enumerated, mixed or compounded in about the proportions specified.

Also, the self-igniting match, compounded of the liquids or fluids enumerated, whether applied separately or mixed, to the explosive compounds or materials sought to be ignited or exploded, substantially as described.

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81,895.—SERVICE PIPE FOR BUILDINGS.—Edward Hagan, New York city.

I claim the casing, E G and N, inclosing the service pipes, forming spaces around the latter, the casings being provided with apertures, d, for the introduct on of steam or hot air to the spaces surrounding the service pipes, which latter are connected by union joints immediately at the points of junction of the several sections of the casing, E G, doors O P Q R, being formed in casing, N, opposite the joints of pipes, L J R, all constructed and arranged in the manner and for the purposes substantially as shown and described.

81,896.—CHURN.—T. Haigh (assignor to himself and C. M. Lightner), Harrisburgh, Pa.

I claim, 1st, Suspending the cubical box between the posts, B B, by attaching the trunnions, b d, to two of its diagonally opposite corners, whereby, as the box is ro ated, the inclinations of its sides are rapidly changed, as herein shown and described.

2d, The cog wheels, E G, and pulleys, D H, and hollow trunnion, d, all operating toge her, substantially as described, in combination with the diagonally suspended box and its dasher, all substantially as shown and described and for the purpose set forth.

81,897. — CRANBERRY GATHERER.—Warren Hall, Dennis, Mass.

I claim the arrangement of the joint axle with respect to the chute, when hinged to the carriage body, as set forth, the said axle, undersuch arrangement, being fastened to the chute.

Also, the combination and arrangement of the series of knives, k k l, with the chute, its teeth and carriage combined, as set forth.

Also, the combination of the receiver, made as described, with the carriage and the chute combined, and constructed in manner and so as to operate as specified.

81,898.—PLANING MACHINE.—S. M. Hamilton, Baltimore, Maryland.

I claim the combination of the adjustable guides, D, with the cutter head, constructed and operating substantially as described and shown.

81,899.—STOVEPIPE THIMBLE.—Gunder E. Hammer, Rochester Minn.

I claim the stovepipe safe, as constructed, of the inner cylinder, B, outer cylindrical casing, A, and perforated h ads, the lower head being made in two parts, one of which is fixed to the cylinders, A B, while the other, E, is hinged to the outer cylinder, and provided with fastening devices, as herein shown and described for the purpose specified.

81,900.—COCK OR FAUCET.—Chas. Harrison, New York city.

I claim, 1st, The piston h, formed hollow, in combination with the guide, m, valve, n, and cylinder i, as and for the purposes specified.

2d, The grooves, t, within the cylinder, i, in combination with the piston, h, and valve, n, as and for the purposes set forth.

81,901.—BRICK MACHINE.—Peter Hayden, Pittsburgh, Pa.

I claim, 1st, The intermittingly rotating cylinder, M, provided with the press boxes, L', followers, T, recesses, d, and teeth, i, in connection with the crank arm, f, on shaft, N, all arranged to operate in the manner substantially as and for the purpose specified.

2d, The plunger R, operated substantially as shown and arranged, in relation with the followers, T, for the purpose of compressing the clay in the press boxes, substantially as set forth.

3d, The plunger, U, operated from the plunger, R, through the medium of the lever, V, for the purpose of discharging the bricks from the press boxes, L', substantially as shown and described.

4th, The combination of the pressure rollers, F I, rotary shaft, K, provided with the spiral wings or blades, b and b', the cylinder, W, provided with the press boxes, L', with the followers, T, therein, the plungers, R U, and the fixed cam, X, all arranged to operate in the manner substantially as and for the purpose specified.

81,902.—FIFTH WHEEL BENDER.—G. W. Heckart (assignor to himself and C. Kramer), Columbiana, Ohio.

I claim a bending machine for fifth wheels consisting of a series of forms, B, clamping screw, C, and adjustable bending device, formed of the arm, x, rollers, f and h, levers, D 7 8 9 and 12, lnk, 11, and arm, 10, the whole being constructed, arranged, combined, and operating as he ein described and for the purpose set forth.

81,903.—MANUFACTURE OF SHEET AND PLATE IRON.—C. C. Hinsdale, Cleveland, Ohio.

I claim, 1st, The herein described compound, and the manner of using the same, in the process or mode of making plate or sheet iron, substantially as and for the purpose set forth.

2d, Coating the metal with plastic alloy separately, and in combination with lamp black, or its chemical equivalents, for the purpose set forth in the process described.

81,904.—STOVE GRATE.—Benjamin F. Holbrook and Ebenezer B Rumrill, Boston, Mass.

We claim a movable bed-plate, B, substantially as and for the purpose set forth.

Also, a bed plate, B, revolving on balls, c c c c, substantially as and for the purpose described

Also, the movable bearing or loop, g, in combination with the revolving bed-plate, B, and arbor, D, of the revolving grate, C, substantially as described for the purpose set forth.

Also, the annular ring, H, for protecting the revolving bed-plate and supporting the lining, substantially as describe l.

Also, the sliding and removable port cover, F, in combination with the port E, and arbor, D, with its spring, m, constructed and operating substantially as and for the purpose specified.

Also, an arb r, D, so pivored to its grate as to admit of being readily connected therewith or disconnected therefrom, substantially as and for the purpose set forth.

81,905.—VENTILATOR.—William Holzhauser, Buffalo, N. Y.

I claim, 1st, The combination, with the system of pipes, B b' F, of a fan blower, C, for the purpose and substantially as described.

2d, The combination with said system of pipes, of the revolving wind catcher, D, constructed and operating substantially as and for the purpose described.

3d, In combination with the above, the main regulating dampers, G G', and registers, H H', arranged and operating as described.

81,906.—COTTON SEED PLANTER.—Gilbert Jessup, Shortsville, N. Y. Antedated August 27, 1868.

I claim, 1st, The construction and arrangement of the revolving cylinder, B, with its slots, J, shaft, P, in combination with the stationary cylinder, A, or its equivalent, for the purposes herein described.

2d, The rock shaft, b, arm, H, and spring, o, in combination with the revolving cylinder, B all acting conjointly, in the manner and for the purposes shown and described.

3d, The spring, G, or its equivalent, in combination with the pins, v, for the purposes set forth.

4th, The longitudinal adjustment of the shaft, P, and cylinder, B, in combination with the stationary cylinder, A, or its equivalent, for the purposes of regulating the quantity of seed being distributed.

81,907.—WATCH REGULATING ADJUSTMENT.—Frank G. Johnson, Port Richmond, N. Y.

I claim the fixed screw shaft, a, upon which the grooved nut, c, carrying the end of the regulating hand, d, is rotated, all arranged and operating as described, for the purpose specified.

81,908.—MANUFACTURE OF IRON AND STEEL.—John Allcock Jones, Middlesbrough, England.

I claim, 1st, The production of iron and steel, from cast or refined iron, by first melting or puddling the same, adding thereto purifying agents or fluxes, then separating as much of the slag as it is practicable to separate therefrom, and removing the crude iron or metal resulting to furnaces or crucibles, and melting the same, as hereinbefore described

2d, The preparing the crude iron or metal without the employment of a puddling process, and melting the same into cast steel, as hereinbefore described.

3d, The conversion of cast iron into malleable iron without the employment of the puddling process, by allowing the metal to remain for a sufficient period in the puddling or other furnace, as hereinbefore described.

4th, The employment of a bath, consisting of a slag or cinder, in which the crude iron resulting from the processes before referred to is melted, so as to be converted into steel, as hereinbefore described.

5th, The subjecting the crude iron resulting from either of the processes hereinbefore described to pressure, so as to separate the portion of the cinder or slag therefrom, prior to its being placed in or upon the steel melting hearth or furnace.

81,909.—ICE BOAT.—Thomas B. Kelley, Dundee, Ill.

I claim a boat, provided with the water tight compartment or case, B, open at top and bottom, with the propelling wheel mounted in a sliding adjustable frame, D, fitted within said case, B, for the purpose of adapting the boat for use either on the ice or water, substantially as set forth.

81,910.—ESCAPEMENT.—Wm. C. Kellum, San Francisco, Cal.

I claim, 1st, The detent, F, and the adjusting screw, d, together with the curved arm, H, and the spring, I, operated by the liberating pin a, or its equivalents, k cking by spring or gravitation, substantially as and for the purpose described.

2d, The escape wheel, B, moving in a plane parallel to that of the balance staff and of the plates, A A, and giving impulse to the pallet, c, either from the sides or point of the teeth, in combination with the detent, F, arm, H, and spring, I, substantially as described.

3d, The balance staff, C, standing parallel with the plate, A, and the liberating pin, a, passing alternately above and below the lip, J, at each vibration, substantially as described.

81,911.—CORN PLANTER.—I. J. Kidd, Young Settlement, Texas. Antedated August 28, 1868.

I claim the arrangement of the feed wheel, c, pulleys, K K, plow beam, B, cords or bands, j j, roller, I, spout, F, and plows, B and H H, the several parts being constructed and operated substantially as and for the purpose specified.

81,912.—FACE TESTER FOR MILLSTONES.—James Kuhn, Mount Pleasant, Pa.

I claim the circular block, A, of wood or other suitable material, provided with concentric annular projections, a, on its face side, substantially as and for the purpose set forth.

81,913.—BURGLAR ALARM.—N. P. Larsen, Chicago, Ill.

I claim, 1st, The lever, D, plate, E, with pin, f, spring, F, and wire H, all combined and operating as and in the manner herein described, and for the purpose specified.

2d, In combination with the above, the pin, b, of the hammer, B, and the boubin, O, arranged substantially as set forth.

3d, The key, K, when used as described, and provided with cam, L, for the purpose of operating the trigger, N, as herein shown and specified.

81,914.—SEEDING MACHINE.—J. L. Linderman, Rockford, Ill.

I claim, 1st, The wheels, E, provided with seed channels upon their peripheries, extending rearward from the seedcups, and made tapering in form, as shown and described, for the purpose set forth.

2d, The wheels, E, constructed as described, in combination with partitions, F, constructed and arranged as described, doubleinclines, G, and spouts, G', the whole, being combined and operated substantially as and for the purpose described.

3d, The wheel, C, and shaft, c, and slotted bearings, c', in combination with gear wheels, B D', and frame, A, as and for the purpose described.

81,915.—LAMP SHADE.—E. A. Locke and W. N. Weeden, Boston, Mass.

We claim a lamp shade ring made from a strip, when the abutting ends of the strip are held together by projections thereon, which are inserted into a loop formed on one of the spring supports, f, as specified.

81,916.—VARNISH FOR METAL, WOOD, AND PAPER OR OTHER FABRIC.—Robert Love Hoboken, N. J.

I claim an enamel paint, or varnish, composed substantially as described, for the purposes specified.

Also, forming or compounding an enamel, paint, or varnish of the materials specified, substantially as described.

81,917.—LAMP CHIMNEY CLEANER.—M. N. Lovell, Erie, Pa.

I claim, 1st, The handle, A, of a lamp chimney cleaner, provided with the spring clamp, b, and hook, e, substantially as and for the purpose described.

2d, The handle, A, of a lamp chimney cleaner, provided with the grooved and curved portion, B, in combination with the clamping spring, b, and hook e, substantially as and for the purpose described.

81,918.—STUMP EXTRACTOR.—Charles C. Manuel (assignor to himself, William G. Elkins, and O N. Elkins), North Troy, Vt.

I claim, 1st, The arrangement of the main timbers, A A and their accessory cross beam, B, braces, D and E, uprights, C and H, cross beams, G, bolster, J, when mounted on four wheels, and constituting the frame of a machine for extracting and removing stumps and other heavy bodies, all substantially as shown and described, and for the purpose set forth.

2d, The arrangement of the chain, a, and its accessory sheaves or pulleys, d e g, and hooks, b b' c, and roller, f, in combination with a frame mounted on wheels, substantially as described, and any suitable gearing for actuating the said chain, all as and for the purpose set forth.

3d, The combination, in a stump extractor, of the accessory gearing, k j h l m, and rope, n, all arranged to operate substantially as and for the purposes set forth.

81,919.—GARBAGE BOX.—John L. Mason, New York city. Antedated August 27, 1868.

I claim, 1st, The rising and falling slide, S, in combination with the garbage receptacle, R, constructed and operated as and for the purpose described.

2d, The revolving column, P', in combination with the slide, S, and receptacle, R, constructed and operated as and for the purpose set forth.

81,920.—MEDICAL COMPOUND FOR CATTLE AND OTHER ANIMALS.—David P. Mathews, Winthrop, Mass.

I claim as my invention the said composition, composed of the constituents hereinbefore mentioned.

81,921.—CLOTH MEASURING MACHINE.—David Max (assignor to himself and Thomas Waltz), Newton, Ill.

I claim 1st, The indicator, consisting of the shaft, H, worm, I, spurwheel, F, pointer, K, a d annular index, G, in combination with the rolls, C D L L', and friction brakes, N N' all arranged and operating substantially as described for the purpose specified.

2d, In combination with a cloth measuring machine, substantially as herein described, the rolls, L L', composed of the roll proper, a, and clamping piece, a', connected by means of the flaring ferrules or bands, b, substantially as and for the purpose set forth.

81,922.—GAS MACHINE.—Hiram S. Maxim, New York city.

I claim, 1st, A gas machine, in which the production of gas is automatically stopped when its pressure as well as its quantity is excessive, and as automatically re-started when the difficulty is overcome, as set forth.

2d, The cylinder, e, connected with the enclosed tank, D, to show the height and pressure of the contents of the tank, and to convey part of them to the heating chamber as specified.

3d, The burner tube, G, when provided with a valve, h, which is connected by a diaphragm, j, so as to be closed when the pressure of the gas is too high, as set forth.

4th, The combination with each of the four separate vessels, A B D and I, the latter having the elastic diaphragm, J, stretched across it substantially as herein shown and described.

5th, The device for automatically operating the valve, s, which regulates the flow of gas into the gas holder, I, said device consisting of the diaphragm J, pin, o, lever, L, lever, t, arms, w x, and springs, y, all arranged, combined, and operating, substantially as herein shown and described.

6th, The pipe, M, for conducting the evaporated gasoline to the gas-holder, and for mixing it with the required quantity of air, said tube containing the perforated partition, b', the interior tube, c, and the valve, e', all made and operating substantially as herein shown and described.

7th, The cam, z, for keeping the valve, s, closed, as set forth.

8th, The pipe, f', for conducting illuminating-gas from the gas-holder, I, to the heating chamber, a, substantially as and for the purpose herein shown and described.

81,923.—SPRING BED BOTTOM.—A. McDaniel (assignor to himself and S. J. Henion), Dubuque, Iowa.

I claim the combination and arrangement of the rails, B, rods, C, spring, D, and rails, F, provided with the upper springs, L, all substantially as and for the purpose described.

81,924.—FORWARD AXLE FOR CARRIAGES.—Hiram McIlroy, Poplar Ridge, N. Y.

I claim, 1st, The central pivot and socket, in combination with the hooks and flanges on the circles for uniting the head block and axle, substantially as described.

2d, The chambered upper circles and hooks, and pivot socket, provided with the leather packing, substantially as and for the purpose described.

3d, The upper circle bar or plate, provided with the chambered circles and hooks, and with the central pivot, all cast in one piece, and united to the head block in the manner described.

81,925.—COMBINED SPUR AND CREEPER.—Ferdinand Mehrmann, Fountain City, Wis.

I claim a combined spur and creeper, made and operating substantially as herein shown and described.

81,926.—CORSET.—Emilie J. Meriman, New York city. Antedated September 4, 1868.

I claim supporting the corsets and the clothing depending therefrom, by means of straps, I I, the ends of which are attached by an adjustable lacing or other fastening to the waistband or middle of the corset, substantially as and for the purposes set forth.

81,927.—MILSTONE VENTILATOR.—John Metherell, Rockford, Ill.

I claim the arrangement of the pipes, F, provided with fans, as described in combination with the cooling chamber, G, central passage, H, and fan, I, as and for the purpose set forth.

81,928.—BRICK MACHINE.—John C. Miller, Bushnell, Ill.

I claim the tub, E, and shaft, G, in combination with the frame, A, ways, c c, cog-wheels, H and I I, and molds, D D, all constructed as described, and operating substantially as and for the purposes herein set forth.

81,929.—PLANE FOR CUTTING BLIND SLATS.—John H. Miller, Oskaloosa, Iowa.

I claim the pivoted arms, G, and connecting rod, H, upon the carriage, F, when constructed and operating substantially as and for the purpose specified.

81,930.—BELLOWS PUMPING APPARATUS.—Simon Motte, Paris, France, assignor to Isaac Hyneman

I claim 1st, A bellows pump having a depressed valve in its stationary base plate, and a removable cover in its vibrating piston or lid, all substantially as shown and described.

2d, A bellows pump, in which the fluid is received and discharged from near the end opposite the axis of vibration, by means of the piston, B', through confluent pipes, substantially as described.

81,931.—REVERSIBLE LATCH.—W. T. Munger, Branford, assignor to P. Corbin and F. Corbin, New Britain, Conn.

I claim the divided horse-shoe, formed of the part, i, pivoted to the portion, d, in combination with the latch, g, and shank, f, attached to the horse-shoe, so that it may be revolved for reversing said latch substantially as set forth.

81,932.—ORE AND BONE CRUSHER.—Amos Newell, Redwing, Minn., assignor to himself, Henry S. Brown, Frederick Arnold, and Alfred Arnold.

I claim two distinct sets of hammers, so made and arranged as to revolve in opposite directions, adapted to and in combination with the case, A, substantially as and for the purpose described.

81,933.—MILL FOR PULVERIZING BONE, ETC.—Amos Newell, Redwing, Minn., assignor to himself, Henry S. Brown, George F. Arnold, and Alfred Arnold.

I claim the case, A, hammers, B, and partitions, C, combined and arranged substantially as shown, for the purpose herein set forth.

81,934.—WASH BOILER.—Joseph Okey, Indianapolis, Ind., assignor to himself and Ferdinand A. Lehr.

I claim the door, m m, when constructed with slotted sides, in combination with the chambers K K, and pipes, d e, and f, substantially in the manner described, and for the purpose set forth.

81,935.—SEEDING MACHINE.—Lucius M. Olden, Pana, Ill.

I claim, 1st, The application to the seed passage of a drill tooth, of a feeding device, I, or its equivalent, substantially as described.

2d, The combination of feed wheel, y, hinged funnel, G3, and a drill tooth, which is constructed with a feeding device, I, or their respective equivalents, substantially as described.

3d, The vibrating frame, C, carrying coulters, C1, and suspended by means of a lifting chain, L, in combination with drill teeth, which are suspended from said frame, C, by means of chains, L' substantially as and for the purposes described.

4th, The devices, substantially as described, for disengaging wheels, D, from their axle, D', when frame, C, is lifted, in combination with drill teeth which have feeding devices applied within them, substantially as described.

81,936.—BEDSTEAD AND QUILTING FRAME.—John Park, Joliet, Ill.

I claim the arrrangement of the shaft, A, legs, B B B B, with their pawl, D, and rack bar, C, and the rollers, K K, with their ratchets, h, and spring pawls, g, the whole combined, adjusted, and operating as herein set forth.

81,937.—STEAM GENERATOR.—Quintin Parker, New York city.

I claim the combination of the pipe, G, with the boiler sheet, A, suspended from the upper plate of the deflector, E, in rear of the flue sheet, substantially as herein shown and described.

81,938.—SHAFT JOURNAL.—Lewis Patric, Shortsville, N. Y. Antedated August 27, 1868

I claim, in combination with the socket gudgeons, or journals, G, and shaft, S, the screw or threaded eye-bolt, f, and clamping screw, s, as and for the purposes set forth.

81,939.—MEAT CHOPPER.—Thomas Payne, Grand Rapids, Mich.

I claim the combination of the crank shaft, I, gear wheels, K and L, shaft, M, crank wheel, N, pitman, O, arm, P, rack shaft, Q, cross head, R, short connecting rods, S stems, T, and knives, U, with each other and with the frames B, and revolving chopping box, C, substantially as herein shown and described, and for the purpose set forth.

81,940.—SHAFT COUPLING.—Philip Peffer, Milroy, Pa.

I claim the combination, with the shafts, D and E, when connected together by a point and socket, of the spring, C, substantially as and for the purpose described.

81,941.—DROPPER FOR HARVESTERS.—G. M. Peters, Lancaster, Ohio.

I claim, 1st, Hinging or pivoting the platform to a bent arm or support, by means of which it is operated, in such manner as to admit of a reciprocating and tilting movement, substantially as described.

2d, The bent arm or rod to which the platform is hinged, and by means of which said platform is vibrated, in combination with the rod or link for tilting the platform upon its operating arm.

3d, The bent rod or arm, J, link, J', crank, K, connecting rod, L, and lever, M, or their equivalents, in combination with the platform, I, arranged and operating substantially as described.

81,942.—GRASS SEED SOWER.—Darius G. Pickett, Stockton, N. Y.

I claim the combination, with the seed slide, B, of the pins, f f, holes, d d, and cross partitions, g g, the whole arranged as described, and operated in the manner and for the purpose specified.

81,943.—WHEEL FOR VEHICLE.—Henry Poth, Pittsburg, Pa.

I claim, 1st, The combination in a vehicle wheel, of the tenon plates, e, beveled ring, d, screw box, B D, and metal hub, A, substantially as herein shown and described.

2d, The combination, in a vehicle wheel, of the screw box, B D, packing rings, c and f, when arranged to form an oil tight space, h, between the box, B and the metal hub, A, and provided with holes for the screw, i, all substantially as herein shown and described.

81,944.—GAS PRESSURE REGULATOR.—Charles C. Ramsay, Chicago, Ill.

I claim the combination of chamber, B, having the diaphragm, b, with the spiral spring, H, arranged as shown, with the valve, C, resting on the lever, E, connected to the diaphragm by a rod, F, all arranged to operate substantially as herein set forth.

81,945.—CLOTHES-PIN.—Joseph A. Rand, Morrisville, Vt., assignor to Thomas A. Mitchell, Washington, D. C. Antedated August 27, 1868.

I claim the arrangement and construction of the pieces, A and B, with the square head, C, and its aperture, D, at one end, as herein described, and for the purposes set forth.

81,946.—DEVICE FOR LOADING COAL.—Daniel Risher, Jr., Dravosburg, Pa.

I claim, 1st, The mode of loading coal into boats, flats or barges, by sliding the coal down a chute into a hopper hung to a car, and thence running it down an inclined track to the boat, flat, or barge, and discharging it from either end of the hopper into the boat, flat, or barge, substantially as hereinbefore set forth.

2d, The tipping coal hopper, g, made with the bottom concave or sloping down toward the middle from the discharging ends, substantially as and for the purposes hereinbefore set forth.

3d, The tipping coal hopper, g, connected by bearers, d, with a rocking shaft, d', mounted on a car or truck, substantially as and for the purposes hereinbefore set forth.

4th, Sliding bars, m', carrying a coal-hopper, so connected with the bearers, d, as that, by a slight longitudinal motion imparted thereto, the center of gravity of the loaded hopper may be shifted, substantially as and for the purposes above set forth.

5th, A tipping handle, i, attached to the rocking shaft, a, of a coal loading car, in combination with tripping devices, constructed and used substantially as and for the purposes hereinbefore expressed.

81,947.—CHALK AND SAND-PAPER HOLDER FOR BILLIARD-TABLE.—Charles F. Ritchel (assignor to himself and Henry S. Haynes), Chicago, Ill

I claim an improved chalk and sand-paper holder, formed by the combination of the recessed blocks, A and B, with each other, said blocks being constructed and arranged substantially as herein shown and described, and for the purpose set forth.

81,948.—FAUCET.—Francis Roach (assignor to himself and Joseph Zane), Boston, Mass.

I claim the arrangement of the induction and eduction pipes, b c, the valve seat, a, the valve, D, the case, A, the spring, D', the stem, C, the cap, B, the neck, d, the key, E, and the cams, f f, and stops, g g, the whole being as and to operate as hereinbefore described, and as represented in the accompanying drawings.

Also, the arrangement and combination of the two holes, h i, with the key, E, and the spindle, C, arranged and combined with the valve, its spring, and case, as specified.

Also, the combination of the adjusting screw, F, and the annulus, k, applied to the spindle, C, as described, with the key, E, arranged with the spindle, C, its valve, and spring, and the neck, d, substantially in the manner and under circumstances as hereinbefore specified.

81,949.—SOFA BEDSTEAD.—S. R. Roscoe, Obion County, Tenn.

I claim the combination of the cushions, D and E, with the folding headboards, A and B, the hooks, d d, the eyes, b b, and the couplings, m n, all constructed and operating substantially as and for the purpose described.

81,950.—BRIDGE.—Henry A. Rust, and Ludwig Hermann, Chicago, Ill.

We claim, 1st, The arrangement of one or both ends of the main braces, when constructed in a convex or rounded form, in corresponding concave grooves or recesses in the blocks, B and E, substantially as specified.

2d, The arrangement of the inclined end of the counter braces, in a corresponding inclined recess in the top block, to operate substantially as set forth.

81,951.—GRAIN SEPARATOR.—David Shannon, and William Spencer, Winslow, Ind.

I claim, 1st, The combination of the cylindrical drum, M, case, C, with inclined planes, I, openings, H, lever, E, strap, G, and bar, D, all substantially as herein set forth.

2d, The lever, E, pivoted at one end, and suspended at the other by means of a strap, G, in combination with the pivoted center bar, D, when operating for the purpose of giving proper pitch to the box, C, substantially as and for the purposes herein set forth.

3d, The bent wires, i i, on the end of the cylinder, d, when acting in combination with the spout, P, to feed the grain from the hopper, O, into the drum, M, substantially as and for the purposes herein set forth.

81,952.—LATHE HEAD.—Henry F. Shaw West Roxbury, assignor to James A. Woodbury, and Solomon S. Gray, Boston, Mass.

I claim, 1st, The combination of the gears, D and E, the disk, P, having the spring pin, p, and eccentric sleeve, c, attached thereto, and the pulley block, C, provided with the eccentric sleeve, d, all arranged substantially in the manner and for the purpose specified.

2d, The combination of the pulley block, C, provided with the cam sleeve, d, disk, P, and eccentric collar, c, catch, S, and gear wheel, E, substantially as and for the purpose set forth.

81,953.—MECHANISM FOR OPERATING THE BED OF PLANING-MACHINES.—Henry F. Shaw, West Roxbury, assignor to James A. Woodbury, and Solomon S. Gray, Boston, Mass.

I claim, 1st, In combination with the bed of a planing machine, the rack, e, pinion, d, and shaft, g, or their equivalents, and the internal and external gears, f e, eccentric sleeve, i i', and the fast and loose pulleys, when arranged and operating substantially as specified, and for the purpose set forth.

2d, The arrangement on the shaft, g, of the fast and loose pulleys, the eccentric sleeve, i i', and the internal and external gears, e e', substantially in the manner shown, and for the purpose set forth.

81,954.—LADDER OR STEP FOR STREET LAMP-LIGHTER.—M. M. Smith, Nashville, Tenn.

I claim a step ladder for lamp posts, constructed substantially as and for the purpose shown and described.

81,955.—FANNING-MILL.—H. A. Snyder, Shullsburg, Wis.

I claim the hinged board, B, actuated by spring tension acting against the blast of a fanning mill, and connected with gates or valves, H, closing the ingress aperture, I, of the fan wheel box, A, all substantially as shown and described, and for the purpose set forth.

81,956.—MACHINE FOR SEWING THE UPPERS TO THE SOLES OF BOOTS AND SHOES.—Michael Joseph Stein, New York city.

I claim, 1st, In combination with the needle and the self-adapting rest, which is to rest and ride on the sole of the shoe or boot that is being sewed, and which is to bear against the bottom of the inner channel cut in the leather, to resist the pull of the needle, a second rest, so formed that it shall rest and ride on the surface of the sole, that in sewing it may not interfere with the loop of thread, the two being connected and having a mode of operation in connection with the needle, substantially as herein described.

2d, The curved needle, when made and mounted so that its inner curved surface is concentric with its axis of vibration, and eccentric on its outer surface, substantially as and for the purpose specified.

3d, The pointed cast off, with its outer surface eccentric, in combination with the needle, the contiguous surfaces of the two being flat, and both being mounted, so that they shall work in contact, substantially as and for the purpose set forth.

4th, Attaching the lamp and its cap, and the flue through which the thread passes, to the movable plate which carries the sewing mechanism, substantially as described, that the means for heating and guiding the thread may be always in the same relative positions, as set forth.

5th, The feeding pawl, with its projections, working in cam-formed recesses, or the equivalent thereof, having a like mode of operation, in combination with the movable table on which the last holder moves, or the equivalent thereof, by means of which combination the feeding pawl spaces the stitches equally, notwithstanding it acts on the undulating surface of the sole, as described

6th, The welt guide, substantially such as described, in combination with the mechanism, or the equivalent thereof, for guiding the sole on the last relatively to the sewing mechanism, as described.

81,957.—FANNING MILL.—William Stoddard, Winona, Minn.

I claim, 1st, The combination, with the hopper of a fanning mill, of the oscillating feeding bar, A, substantially as and for the purpose described.

2d, The combination with the screen, C, of the endless apron or belt, D, substantially as and for the purpose described.

3d, The rotary screens, L and M, arranged as described, in combination with the chute, G, screen, C, and fan blower, substantially as and for the purpose described.

81,958.—SAFETY BRIDGE FOR RAILROAD CAR.—Eli Sturgeon, Columbiana, Ohio.

I claim the adjustable bridge, A, with spiral springs, b b, attached to the bumpers or platforms of railroad cars, C, by means of hook, d d, on the four uprights, c c c c in the manner and for the uses and purposes set forth and herein more fully described.

81,959.—TAILORS' PRESS BOARD.—Howard M. Thompson and Charles W. Burbank (assignors to themselves and George H. Knowlton), Alfred, Me.

We claim the press board supporter substantially as described, that is, as composed of the base board, D, the standard, C, the arm, E, and the clamp-jaw, F, connected in the manner so as to operate as explained.

Also, the combination and arrangement of the adjusting screw, e, and nut, f, with the connection rod, c, the clamp jaw F, the base board, D, the standard, C, and the arm, E, arranged and combined substantially in manner and for the purpose as specified.

Also, the combination of the press board, B, and mechanism, substantially as described, for supporting it above, and fixing or clamping it to a table, as explained, such mechanism consisting of the base board, D, the standard, C,

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the arm. E, the clamp jaw, F. and the connection rod, c, or their mechanical equivalents.

81,960.—BRIDGE.—James K. Thompson, (assignor to himself and William B. Howard), Chicago, Ill.

I claim the wrought iron chords, A A', each consisting of several bars placed apart and edgeways, and the plates, b b' and stays, E E, connecting the said bars, when used and arranged substantially as herein described and specified.

81,961.—CAR COUPLING. — Anson C. Tichenor, Council Bluffs, Iowa.

I claim the combination of a draw head, A, constructed substantially as described, and provided with a transverse locking ledge, a, with a hinged block, B, constructed with a shoulder, c, when said block is so connected to the draw head that the forward motion of the cars will automatically lock the shoulder, c, beneath the ledge, a, in the manner and for the purposes specified.

81,962.—ENVELOPE.—Sigmund Ullman, New York city.

I claim securing the eyelet, d, in the open flap, c, of the end, by gumming a strip of paper over said eyelet, at the outer side of the flap, as herein shown and described.

81,963.—ENVELOPE.—Sigmund Ullman, New York city.

I claim an envelope having its ends cut and folded in the manner as herein shown and described.

81,964.—STEAM CONDENSER.—Augustus Van Orsdale, Jasper, N. Y.

I claim the combination of the exhaust pipe, C, and deflector, D, with the plates, a a, heater, A, and pipes, B B, arranged and operating substantially as described.

81,965.—MAKING FORKS.—Heman Whipple and Elon Denio, Baldwinsville, N. Y.

We claim, 1st, The cutters, e e, formed wider apart near the stock than at the cutting edge, in combination with the shear, b, for the purposes and as set forth.

2d, The rocking support, i, in combination with the cutter, e, and bed shear, h, for the purposes and substantially as set forth.

3d, The swinging supports, 12, in combination with the winding wedge-shaped, bending plunger, m, arranged and operating substantially as and for the purpose set forth.

4th, The connecting rod, b, and ball, 1 in combination with the screw, 3 head, 4, and hollow plunger, c, carrying the cutting or bending tools, substantially as set forth.

81,965.— BRUSH.—John L. Whiting, Boston, Mass.

I claim the combination and arrangement of the series of projections with the other parts of the brush, as described, the series being productive of new and useful effects, as specified.

81,967.—DOUBLE RATCHET LEVER POWER.—John S. Williams, Chicago, Ill.

I claim, 1st, The combination of the double ratchet pawl, A D ratchet pinion, F, lever, E, connecting rod, 14, lever, fig. 4, arm 22, treadle, fig. 5, and balancing weight, fig. 6, substantially as set forth.

2d, The combination of the ratchet pinion, F, and gear wheel, g', as and for the purpose set forth.

81,968.—OIL TANK.—Arthur Gates Wilson, New York city.

I claim, 1st, The bottom, F, strainer, H, and tube, G, all arranged and combined substantially as described and for the purposes set forth.

2d, The detachable head B, when so arranged within the cylinder, A, as to have its upper surface fall below the walls of said cylinder, to operate in connection with the supplemental cover, C, substantially as and for the purposes specified.

81,969.—BOW SPRING FOR RAILWAY CARS.—T. F. Allyn, Nyack, N. Y.

I claim a bow spring, composed of one or more plates of metal, either square, rhombic, circular, oval, or any equivalent shape, bent to the form of a bow, so as to have two outside bearing surfaces or points opposite to each other, or nearly so, substantially as described.

Also, the application of the foregoing described plates, in combination with the bolsters or frames of cars or carriages, substantially as described, and for the purpose set forth.

81,970.—COMBINED SCREW DRIVER AND WRENCH.—Edgar John Amor, New York city.

I claim the blade, B, provided with a series of angular-shaped openings, a, near its handle end, with an oblong slot, b, in combination with a removable or detachable fork screw, driving blade, or other bit, arranged to stand at right angles to the blade, B, near its forward end, for operation essentially as described.

81,971.—FEED WATER HEATER AND FILTER.—James Armstrong, Bucyrus, Ohio.

I claim, 1st, The pans, B B, when constructed and arranged substantially in the manner shown and described.

2d, The combination of the steam pipe, G, chambers, F and F', substantially in the manner shown and described.

3d, The chambers, F F', and the filters, e and f, when constructed substantially in the manner shown and described.

4th, The arrangement of the pans, B B', and the disk, B'' substantially in the manner described.

81,972.—STEAM GENERATOR.—James Armstrong, Bucyrus, Ohio.

I claim, 1st, The arrangement of the outer and inner tubes of the boiler whereby the heat is caused to circulate around the inner ones, substantially as shown and described.

2d, The construction of the fire box with the surrounding tubes, as herein shown and described.

3d, The construction of the hollow screws, a, and the arrangement of them with the tubes, B, as herein shown and described.

81,973.—ROLLING MILL.—J. H. C. Bachelder, Winsted, Conn.

I claim, 1st, The slides, J J, with their racks, O, movable bearings, H H, graduated wedges, K, guards, L, and pinions, P P, when arranged, constructed, and operating as described and for the purpose set forth.

2d, The tongs, V, with their lever, Z, spiral spring, X, lever, W, and cam-wheel, U, when arranged, constructed, and operating as described, and for the purpose set forth.

3d, The pin, b, on sliding wedge, in combination with dog, c, shaft, d, upright slotted arm, e', bell lever, f, horizontal side, g, clutch, h, movable coupling, l, treadles, m and p, rod, n, spiral spring, w, loose sleeve, s, arm, u, and shoulder, v, all arranged and operating as set forth.

81,974.—APPARATUS FOR THE MANUFACTURE OF HEATING AND ILLUMINATING GAS.—John A. Bassett, Salem, Mass.

I claim, 1st, The arrangement of the valve, J, in connection with a reservoir of hydrocarbon liquid, for the purpose set forth.

2d, The combination of the chamber, E, with the pump, B the chamber containing a series of foraminous diaphragms or fibrous material, for the purpose substantially as described.

81,975.—YELLOW WASH FOR BARNS, BUILDINGS, ETC.—Henry Bechtold and John Nunamacher, Lancaster county, Pa.

We claim the composition of a yellow wash or paint, combined substantially in the manner and for the purpose specified.

81,976.—STEAM SAFETY VALVE.—Horatio B. Beckman, Newburg, N. Y.

I claim the arrangement of the safety valve, A, adjustable elliptical springs s1 s2 s3, and plate, C, substantially as herein specified.

81,977.—SEWER PIPE.—Charles Birkenshaw, Chicago, Ill.

I claim the combination of the chamber, B, pipes, B B', and valve, C, arranged substantially as and for the purpose set forth.

81,978.—HARVESTER RAKE.—George Blake (assignor to himself and Thomas Connar), Whitby, Canada.

I claim, 1st, The case, G, and hollow pedestal, F, for containing and supporting the gearing that operates the rake, substantially as herein shown and described.

2d, The combination of the connecting rod, J, internally toothed segment, 1, gear wheel, H, shaft, E, bracket, D, and rake head, C, with each other and with the hollow pedestal, F, and case, G, substantially as herein shown and described and for the purpose of operating the rake, B C.

3d, The spring, L, attached at one end to the bracket, D, and at the other end to the rake head, C, by the pin, M, passing through a slot in the journal of the rake head, in combination with the finger, F, and fixed plane, O, all ranged and operating as described, for the purpose specified.

4th, The combination of the finger, N, stop pin, P, and plane, O, with the rake head, C, and hollow pedestal, F, whether said plane be stationary or adjustable, substantially as herein shown and described and for the purpose set forth.

81,979.—MODE OF PURIFYING WATER.—M. S. Bringier, Ascension parish, La.

I claim the process of filtering water by passing it through a vessel constructed and operating substantially as described, whereby it is subjected to the action of centrifugal force, and a more rapid filtration is effected, as set forth.

81,980.—POTATO DIGGER.—Albert Burhaus (assignor to himself and Henry H. Burhaus), Albany, N. Y.

I claim, 1st, The scoop, E, furnished with the lateral slots, e e e, in combination with the rollers, r r, or their equivalents, as and for the purpose set forth and described.

2d, The double share, B, in combination with the land shoe, C, and the scoop, E, as and for the purpose set forth and described.

3d, The sieve, J, operated by the rod, o, shaker piece, s, rod, d, crank, c, pinion, p, and gear, x, and all in combination with the wheels, N N', and frame, G, and axle, F, as and for the purpose set forth and described.

4th, The sled runners, L L, and boxes, K K', in combination with the sieve, J, and its carriage, as and for the purpose set forth and described.

81,981.—STOCKING STRETCHER.—R. K. Chandler, Ruther Glen, Va.

I claim, 1st, Constructing a stocking stretcher with the hinged sections, A B, and the catching device, D, a arranged at the upper side of the sections, in such a manner that the stretcher is expansible after the stocking has been drawn upon it, substantially as described.

2d, Providing for lengthening or shortening the foot portion of a stocking stretcher, by means of a longitudinally adjustable toe section C, substantially as described.

3d, Forming notches or serrations, C, upon the edges of a stocking stretcher, substantially in the manner and for the purposes described.

81 982.—FARM GATE.—Lewis Charles, Clear Springs, Md.

I claim, 1st, The combination of the sliding gate, A, with the pivoted supporting bar, d d', substantially as described.

2d, The combination of the spring stop, s, bar, d d', panel, B, and gate, A, substantially as described.

81,983.— STEAM GENERATOR. —Jonathan M. Clark, New York city.

I claim the angular hollow head, B, constructed with passages, c, for the circulation of water or steam, secured together by pin projections, g, and nuts, f, and with removable covers, a, combined with the tubes, A, substantially as shown and described for the purpose set forth.

81,984.—SUSPENDER.—C. H. Cleveland, Selma, Ala.

I claim the suspender or shoulder brace, composed of two single straps, B B, each passing from the attaching strap at the one side over the shoulder to the attaching strap on the reverse side of the body, when shoulder straps are provided with eyelets, d d, and a bracing cord, D, substantially as described and for the purpose specified.

81,985.—CAR COUPLING.—James M Cook, Washington, D. C.

I claim the coupling link, B, provided with a shoulder, b', the lever, C, spring, D, and rod, F, when the whole are arranged and combined substantially as described as and for the purposes specified.

81,986.—FLEXIBLE ABRADER AND POLISHING FABRIC.—John H. Crane, Charlestown, Mass.

I claim as a new article of manufacture, the double surfaced flexible abrader, substantially as shown and described.

81,987.—METHOD OF PREPARING, DISICCATING, AND PRESERVING FISH.—William D. Cutler, Philadelphia, Pa.

I claim, 1st, The boned and disiccated fish, as a new manufacture and commercial article.

2d, The herein described process or method of treatment of fish, substantially as set forth for the purposes specified.

81,988.—DOOR AND SAFE LOCK.—John Dillingham, Turner, Me.

I claim, 1st, The peculiar constructed key, having projections or bits, a b c, substantially as and for the purpose set forth and described.

2d, The arrangement of the main bolt, in combination with the plunger m, and levers, g g, substantially as described and for the purposes set forth.

3d, The form and arrangement of the plunger, in combination with the levers, g g, acting on the paws, f f, substantially as described.

4th, The arrangement of the sliding plates, which effectually close the several key holes, as and for the purposes substantially as described.

81,989.—LOW WATER DETECTOR FOR BOILERS.— Thomas Durton (assignor to himself and Thomas Maguire) Port Jervis, N. Y.

I claim the construction of the plug, a, substantially as herein set forth.

81,990.—COMBINED LATCH AND LOCK.—Nathaniel Edwards, Newark, Ohio.

I claim, 1st, the manner of connecting and disconnecting the two knobs, in connection with any opening face plates of locks, by making an indenture G', in connection with either one of the knobs, and a corresponding projection, G, in the other, substantially as above described.

2d, The plate or tumbler bearer, E, in fig. 5, being a slotted plate, with a projection, P, turned out at one end to hold the tumblers in position so that the bolt may work as latch, and with another projection, y, or indenture in such a position as to enter a corresponding indenture, y', or projection in the spindle of the knobs, so as to engage with the same when the tumblers are dropped, when constructed substantially as herein shown and described.

3d, the lever, D, fig. 7, which has a lifter, p, for the joint purpose of raising, the tumblers and bracing back the bolt, and in combination with the locking projection, a, and the stud, A, and the projection, R or its equivalent on the bolt, for the purpose above specified, when made and arranged substantially as above shown and described.

4th, The manner of converting the lock from a latch into a night bolt, by raising the tumblers too high to be operated upon by the key, and bracing the bolt in the same operation, by elevating the lifter, p, of the lever, D, by the assistance of x', with its connections, and then locking the same in its elevated position, by causing the stud, A, to engage with the projection, a, by pulling out the tumbler bearer as above specified.

81,991.—MEANS FOR SECURING SPRINGS FOR BEDS AND SEATS —Jeresiah D. Eggleston, Canaan, Conn.

I claim the screw nut, A, combined with the spring, B, substantially as and for the purpose set forth.

81,992.—DYE STUFF.—C. E. Fox, and Mary E. Fox, Gilroy, Cal.

We claim the extract, or coloring matter, of mancineta, as a new article of manufacture, for its various uses, as herein specified.

81,993.—WEDGE-BUCKLE FOR HARNESS.—Kasson Frazer, Syracuse, N. Y.

I claim, 1st, The wedge, W, when made with the transverse slot i, hole, m, and stop, r; the tongue, T made with the journal, o, shank, p, and guard q, each substantially in the form and for the purposes described.

2d, Also, the same parts, in combination with each other, when connected by a joint, and forming a wedge and tongue, substantially in the manner and for the purposes described.

3d, The wedge, W, and tongue, T, when made as aforesaid, in combination with the buckle frame, A, having an angular box, x, as described, all operating in the manner and for the purposes substantially as above set forth.

81,994.—MALT MILL.—John Gardiner, Philadelphia, Pa.

I claim the construction of the cheeks, D D, with steel plates, E E, and the arrangements of the said cheeks with the mashing rollers, B C, substantially in the manner hereinbefore described, and for the purpose set forth.

81,995.—SMOKE HOUSE.—Christian Good, Arcanum, Ohio.

I claim a stationary smoke-house, when constructed as described, and provided with a fire pot, H, trap door, C, in the roof, and with openings in its sides, said openings being covered with wire netting and closed by means of shutters, F F, substantially as and for the purposes herein set forth.

81,996.—PLOW.—Charles T. Grimes, Garrard county, Ky.

I claim, 1st, The modes of making handles, H and K, and so arranging them on beams, G and J, that they may be used as handles for two turning plows, and as helves for two shovel plows, when the turning plows and helves, V and S, and rods, T and W, are removed.

2d, The mode of combining the handles, H and K, and beams, G and J, by means of cross-bars, A a and B b, and rods, C c and D d, and rods E e and Z z, so that the two plows are used by one person.

81,997.—MOULDING MACHINE.—J. P. Grosvenor, Lowell, Mass.

I claim the described arrangement of the hand wheel, J, at the side of the machine, under the edge of the table, A, the beveled gearing, h' i, shaft, H, pinion wheels, h G, screw, F, vertically sliding mandrel-frame, D, and guides, E, as herein set forth, for the purpose specified.

81,998.—ANTI INTERFERING BAND.—William H. Hall and John R. Clifford, Boston, Mass.

We claim, as an article of manufacture, an interfering rubber guard, when constructed as described, and attached to kersey, as herein shown and for the purposes set forth.

81,999.— CONSTRUCTION OF DOLLS' HEADS. — George H. Hawkins, New York city.

I claim a toy figure head, when composed of a textile fabric, which is previously stiffened with a glutious material, then pressed in parts between heated dies, and afterwards having the edges or seams of such parts joined by means of heated dies, in the manner substantially as herein described.

82,000.—CANDLESTICK.—William H. H. Hinds, Groton, Mass.

I claim, 1st, The cap, a, with its support or supports, n, for the purposes set forth, and substantially as herein described, and as shown in figures 1, 2 and 3.

2d, The receptacle, g, and the slide or sleeve, h, with the catch, p, for the purposes set forth, substantially as herein described, and shown in figures 1 and 3.

3d, The snuffers, f f, supported and operated by means of the cylinder, c, and the collar, d, substantially as herein described, and as shown in figures 1 and 4.

4th, The slit, o, and the notches, 1 2 3 4 5, together with the thumb piece, z, for the purpose set forth, substantially as herein described, and shown in figures 6 and 9.

82,001.—ABDOMINAL SUPPORTER.—S. L. Hockert, assignor to G. W. Perrine), Milwaukee, Wis.

I claim, 1st, Connecting the side spring to the front pad by hooks, in the manner shown.

2d, The side or hip pads, D, attached loosely to the cylindrical side springs, B B, by staples, F, so that the said pads may be perfectly free to move in any direction to adapt themselves to the surface of the body.

3d, Securing the cylindrical side springs to the back pads by screwing the ends of said springs into the button studs, in the manner shown.

82,002.—HORSE HAY-RAKE.—William Holmes, Clarksville, N. Y.

I claim, 1st, The locking bolt, M, moving on a guide way on the axle, and operated by means of the lever to hold the teeth down, substantially as set forth.

2d, The combination, substantially as set forth, of the lever operated by the foot of the driver, and the device for depressing and elevating the rake teeth.

82,003.—SMOKE STACK.—George Holton, Chicago, Ill.

I claim the inverted conical netting, D, attached to the top of the double conical case, B, arranged with reference to the pipe, A, and deflector, C, the latter being held in position over the pipe, A, by rods, E, and having a flange, G, at its top, for supporting the lower end of said netting, substantially as and for the purpose specified.

82,004.—MORTISING MACHINE.—Jas. M. Johnson and John Herig, Cleveland, Ohio.

We claim chisel holders, F F, constructed as described, in combination with the cross head, E, to operate as and for the purpose set forth.

82,005.—BUTTER COOLER.—Ernest Kaufmann and Antony Weber, Philadelphia, Pa., assignors to Ernest Kaufmann.

We claim, 1st, The construction of the part, A, with the ring, C, and combining the chamber, D, therewith, substantially in the manner and for the purpose above described.

2d, The combination of the slip collars, E, journals, a a, and bearings, b b, with the part, A, and cover, B, and spring, C, substantially as described and for the purpose set forth.

82,006.—BEE HIVE.—H. A. King, Nevada, Ohio.

I claim, 1st, The slots, z, in connection with a double tier of honey boxes with comb foundations, as specified, and for the purposes set forth.

2d, Constructing the close fitting top bars, O, with comb guides, U, and slots, as specified, and for the purposes set forth.

82,007.—ROTARY STEAM ENGINE.—Abraham Kipp, Jr., Sing Sing, N. Y.

I claim, 1st, The combination of double cylinders, C C, and D D, open at their inner ends to a steam chamber or space, pistons, E E, and F F, with their rods and yoke, G and H, crank, I, and valve controlling the flow of steam to and from the backs of the pistons, essentially as herein set forth.

2d, The combination of the double cylinders, C C, and D D, arranged, either pair at right angles, or thereabouts, to each other, and with their inner ends open, as described, and in communication with a central or intermediate steam chamber or space, pistons, E E and F F, with their rods, b b, c c, and yokes, G H, crank, I, and valve control ing the admission and escape of steam to and from the backs of the pistons, substantially as specified.

3d, The valve, K, when constructed and arranged for operation, in combination with the double cylinders, their pistons and crank, substantially as shown and described.

82,008.—ANIMAL TRAP. — T. B. Kirby, Flowerfield, Mich.

I claim the combination and arrangement in the rectangular frame, A, divided by the partitions, C and E, of the valve, H, with the perforated bait box, K, having a hinged cover, F, substantially as and for the purposes herein set forth.

82,009.—PAVING ROLLER.—Edmund W. Kittredge, Cincinnati, Ohio.

I claim, 1st, The suspension of one or more cressets to the axle, within the revolving cylinder, substantially as and for the purpose set forth.

2d, The closing with covers the ends of a revolving roller, within which are suspended one or more cressets for holding fire, substantially as and for the purpose set forth.

3d, The arrangement of cylinder, A, revolving on a fixed axle, D, from which are suspended one or more cressets, J and to which are secured the perforated heads, F F', as and for the purpose set forth.

4th, In combination with the elements, A D J F F', one or more doors, H for the purpose explained.

82,010.—JUG TOP.—Peter Lauster (assignor to Lang & Lauster), Allegheny, Pa.

I claim, 1st, The hinge, knob, and lid, made separate and distinct from each other, and united together by making perforations in the hinge and lid, as described, and casting the knob, to unite with them by metal used in producing the knob entering said perforations, to form a rivet, and whereby so der, to establish the junction of said parts, is avoided, and, after riveting of the knob, dispensed with.

2d, The combination, with the lid, hinged to rotate from the inside of the body, of the plate or filling, b, connected with the lower part of the interior flange, a, of the body, substantially as and for the purpose herein set forth.

82,011.—FANNING-MILL.—Elijah Lindsley, Neenah, Wis.

I claim, 1st, The sieves, b and c, when oent as described, and operating as and for the purposes herein set forth.

2d, The screen, d, in combination with the sieves, b and c, when constructed and operating as and for the purposes herein set forth.

82,012.—SPRING BED BOTTOM.—John M. Losie, Indianapolis, Ind.

I claim the slotted metallic plates, E F, constructed as described, in combination with the elastic gum, H, as and for the purpose specified.

82,013.—HORSE SHOE.—Henry D. Lyman, Kalamazoo, Mich.

I claim the attachment of adjustable clips, B, to the heel of a horse shoe when operating with a pivot, substantially as set forth and shown.

82,014.—VISE.—Austin Z Mason, and Richard B. Robbins, Adrian, Mich., assignors to Richard B. Robbins.

We claim, 1st, In combination with the ring, C, constructed with the oblique faces, x and y, the recesses, m' and n, and one or more projecting stops c and e, to prevent it from turning more than one fourth of a circumference, the whole constructed in the manner substantially as set forth and described.

2d, The spherical bilge, D, with one or more ribs, m and n, or their equivalents, in combination with the ring, C, constructed substantially as set forth and described.

3d, The semi-annular ring, K, in combination with the ring, C, and washer plate, B, substantially as described.

82,015.—BREAST PUMP.—Morris Mattson, New York city.

I claim the combination, with a vacuum glass constructed substantially as described, of an exhausting mechanism or instrument, having a double valvular apparatus operating substantially as and for the purposes set forth.

81,016.—FIRE PROOF SAFE.—Wm. McFarland and Wm. H. Butler, Williamsburg, N. Y.

We claim, 1st, The insulation of each section or recess of the door, in combination with the air spaces as and for the purposes herein set forth.

2d, The method of forming spaces, in the filling of the safe, by inserting patterns of wood, to be withdrawn after the filling substance has set, and supplying said spaces with a vaporizing substance, substantially in the manner as and for the purposes herein described.

3d, The manner of securing the separate sections of the doors by placing supporting blocks, made of material which is a non or inferior conductor of heat between them, so that there is no continuation of metal or good heat conducting substance from the outside covering to the inside repository, as herein set forth.

82,017.—HAMMER AND MALLET.—Wm. S. McNeil, Springfield, Mass.

I claim, 1st, A mallet and hammer combined, in which the mallet, B, fits in a socket, a, constructed in the piece, A, having the head, C, with pene, c, the parts being combined and arranged substantially as herein shown.

2d, The arrangement of the pene, c, upon the head, C, of the hammer, substantially as explained.

82,018.—SWING.—Henry F. Metzler (assignor to Louisa Metzler), New York city.

I claim, 1st, The four suspended vibrating rods or bars, in combination with the pivoted cross bars, for supporting the seat or seats, substantially as and for the purpose described.

2d, The four suspended vibrating rods or bars, in combination with the pivoted cross bars supporting a seat or seats, and the lower pivoted cross bars and treadle or treadles, substantially as described.

82,019.—STOVE PIPE DRUM.—Henry Meyer, Richmond, Ind.

I claim the parabolical flues and damper, constructed and arranged in relation to each other and to the casing of the drum, substantially as set forth.

82,020.—SEWER PIPE.—Philip Meyercordt, Chicago, Ill.

I claim the ingredients herein named, when manufactured into pipes, substantially as herein set forth.

82,021.—GATE.—Reuben C. Mighell, Plano, Ill.

I claim, 1st, The lever, C, constructed and operating substantially as described.

2d, The spring, V, in combination with the fulcrum, H, for the purposes specified.

3d, The combination of the gate, A, lever, C, hinge, D, weight, E roller, G, and pivot, F, all constructed and adapted substantially as described.

82,022.—SHOE LACING.—Willard F. Oliver, Lynn, assignor to Boston Shoe-Stud and Button Company, Boston, Mass.

I claim, 1st, A shoe, provided with a series of hooks, or their equivalents, for receiving and holding the string, when arranged substantially as set forth.

2d, The catch or clamp, a, with its arm c, pivoted to the hook, D, and arranged for holding the string, substantially as described.

82,023.—LIME KILN.—Clark D. Page, Rochester, N. Y.

I claim, 1st, The combination and arrangement with the grate bars, g g, of the cross bars, k i, the first being fixed, and forming a fulcrum for the leverage of the grate bars in shaking, and the latter being hinged so as to turn up and down to secure the grates, or allow them to be shaken as herein set forth.

2d, The flues, b, constructed as described, next to the inner edge of the wooden binders, a, of the kiln, to operate in the manner and for the purpose substantially as described.

82,024.—SPICE BOX.—Charles T. Palmer, Norwich, Conn.

I claim, in the spice box or can, as made with a series of holes in its cover or end, or as having a disk or cap to cover such holes, the constructing both the cover or end of the box and the disk, with an annular groove in the one, and a corresponding annular head to project from the other, and to fit to or into such groove, in manner substantially as described.

81,025.—LOW WATER ALARM FOR STEAM GENERATOR.—Stewart B. Palmer, Syracuse, N. Y.

I claim, 1st, The combination of the chamber, B, tubes, C C, with their surmounting chambers, D D, rods, E E, links, a a, and rod, H, arranged and operating substantially as shown and described.

2d, The arrangement of the rod, H, lever, I, and spring, b, with references to the whistle, J, and its valve.

82,026 —WHEAT DRILL.—Charles W. Patton, Exeter, Ill.

I claim, 1st, The hopper, divided into compartments by the partition, D, and door, D', substantially as and for the purpose set forth.

2d, In combination with the perforated plates, E and F, the graduated key, G, for regulating the amount of grain to be sown, substantially as set forth.

3d, The combination of the lever, H, shaft, H1, arms, H2, and the sliding plate, E, with projection, E2, substantially as and for the purpose set forth.

4th, The combination of the sliding plate, E, key, G, stop, E1, and springs, I, arranged to operate substantially as described.

5th, In combination with the cutters, O, and drag bars, K, the springs on the rods, M, segments, N1, shaft, N, and lever, N2, and cord, N3, for raising the cutters and forcing them into the ground, substantially as set forth.

6 h, The combination of the frame, the drag bars, the rear frame, and vertical guide rods, L, substantially as set forth.

82,027.—RECIPROCATING STEAM ENGINE.—Joseph B. Pedrick (assignor to himself and Joseph F. Gent), Lowell Mills, Ind.

I claim the arrangement of the valve, K, valve boxes, G M, and the pipes B A and C D, substantially as shown and described.

82,028.—APOTHECARIES' LABELS.—G. G. Percival, Philadelphia, Pa.

I claim the combination of a graduated scale with an otherwise ordinary paper label, substantially as above described.

82,029.—MARTINGALE.—W. B. Perrie, Horse Head, Md.

I claim, 1st, the loose ring, G, in connection with the part, D, provided with the stud, C, as shown in figs. 1 2 3 4 and 5, substantially as and for the purpose set forth.

2d, A solid ring martingale, D, with the stud, C, projecting from its periphery in the direction of its center, substantially as and for the purpose set forth.

82,030.—ADJUSTABLE TUMBLER FOR PERMUTATION LOCK.—O. E. Pillard (assignor to F. H. North), New Britain, Conn.

I claim the circular tumbler, formed of the plates, 1 and 2, and flanges, 3 and 4, and divided as at 6, in combination with the link plate, e, and eccentric, i, constructed and applied in the manner and for the purposes set forth.

82,031.—WINDOW SHUTTER.—Niels Poulson, Washington, D. C.

I claim, 1st, The combination of the folding bars, A A2, and corrugated plates, B, when said plates are attached rigidly to the inner bars, A, as herein described for the purposes specified.

2d, The sliding plates M, in the described combination, with the folding shutter, A A2 B, to mask or protect the vertical edges of the said shutter, substantially as explained.

3d, The arrangement of the tenons, b' b', of the plate, B, alternately on opposite edges of the bars, A, substantially as and for the purposes set forth.

82,032.—AWNING.—Neils Poulson, Washington, D. C.

I claim, 1st, The folding bars, D D', working upon inclined supports, A, and carrying plates or sheets, E, attached to the inner bars, D, substantially as and for the purposes specified.

2d, The tubes, B, employed in combination with the awning, D E, and trough, C, both as a means of support and for conducting water, as explained.

82,033.—WRENCH. —E. W. Quincy (assignor to himself and W. H. Coop), Lacon, Ill.

I claim a sliding handle, as a constituent element of a hand wrench, substantially as described.

82,034.—TILE MACHINE.—William L. Reck, Drake county, Ohio.

I claim the horizontal rocking frame, N, actuated by the sweep bar, J, and operating the gate, M, to open and close alternately the aperture, e, in the feeding box, E, of my improved machine, substantially as herein set forth.

82,035.—BIN FOR SUGARS, ETC. — Morgan L. Rich, Sand Bank, N. Y.

I claim the bin, constructed as described, consisting of the radial portions, C, around the standard, B all inclosed within the case, having inclined sides, a2, and hinged doors, a1, the latter adapted to close against the edge of the top, D, which forms a scale support, as herein shown and described.

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82,036.—HAY AND COTTON PRESS.—James Robertson, Gosport, Ind.

I claim the combination of the press beam, A, rollers, B B, connecting beam, C C lever, D, winch and axle, G, and rone connecting the axle, the lever, D, and the beam, A, and parts being arranged in relation to one another substantially as described.

82,037.—BRICK MOLD.—William Sangster and John Bretz, Springfield, Ill.

We claim the combination of the frame bars, B, with the bars, D, pivoted thereto, supporting the partitions, C, with the slotted mold box, A, handles, E, and ledges, F, all constructed in the manner described and for the purposes set forth.

82,038.—MEDICAL COMPOUND.—Irving W. Scranton, West Liberty, Iowa.

I claim the above improved compound for the treatment of cholera in any of its stages.

81,039.—CORN SHELLER AND CLEANER.—Nicholas Shock, Baltimore, Md.

I claim, 1st, the combination of the serrated disks, F F, and feed spout, G, substantially as shown and described.

2d, The combination of the toothed disk, C, the revolving apron, m, and chute board, n, all as shown and described.

3d, The combination of the chute board, n, the elevator, and the spout, t, substantially as shown and described.

4th, The combination of toothed disk, C, and the chute board, n, substantially as shown and described.

82,040.—HORSE RAKE.—Francis Smith, Highgate, Vt.

I claim the lever, H, belt, I, pulleys, F and G, bar, b', arms, e', and rake teeth, t, in combination with the pivoted bar, L, bar, N, and fingers, p', all constructed, arranged, and operated in the manner and for the purpose set forth.

82,041.—BIT STOCK.—Robt. D. O. Smith, Washington, D. C.

I claim a bit stock with the jaws, D D, having a parallel movement, and sleeve, C, or the equivalents of these parts, constructed so as to hold the bit truly centered by seizing it by the cylindrical portion in front of the head thereof.

82,042.—DEVICE FOR TURNING SHAFTING.—Norman C. Stiles, Meriden, Conn.

I claim, 1st, The plate, A, and cutters B1 B2 B3.

2d, The arrangement of the centering device, the cutters, and the milling tool, substantially as and for the purpose herein described.

82,043.—POTATO PLOW.—Michael Stoll, Conestoga township, assignor to himself, Benjamin Snavely, and Anthony Isele, Lancaster, Pa.

I claim the arrangement and construction of my shovels, 1 2 and 3, with their respective beams, slots, screw bolts, b, and countersunk segment, G, and adjustable bearings, E, in combination, with or without the separate center piece, A, fig. 2, all made in the manner and for the purpose specified.

82,044.—BIT STOCK.—O. H. Taylor, Brooklyn, N. Y., assignor to Wm. E. Parrish, New York city.

I claim the socket, A, contracted at one side, and adapted for the reception of a shank of a tool which may be secured in the stock by a screw, or its equivalent, so applied as to force the shank into the contracted portion of the socket, substantially as described.

82,045.—METHOD OF FASTENING HAMES.—W. S. Thompson and R. Vincent Love, Montgomery, Ala.

We claim the bar A, latch B, hook D, and button, c, constructed, operating, and arranged substantially as and for the purpose set forth.

Also, the dovetail, d, in combination with the bar, A, and latch, B, constructed and arranged substantially as and for the purpose described.

Also, the hook, B, when arranged with the eyes, f f f, and in combination with the bar, A, and latch, B, substantially as and for the purpose described.

82,046.—MEDICAL COMPOUND.—Thomas H. Upshur, M. D., Norfork, Va.

I claim a medicine for piles, compounded of the ingredients, in the manner, and substantially of the proportions herein specified.

82,047.—SAW FILING MACHINE.—James H. Van Nortwick, Sturgis, Mich.

I claim, 1st, The combination of cam, G, secured to the shaft, D, arm, H, levers, I I, connecting rod, d, pawl, f, and spring, e, all constructed as described, and operating for the purpose of turning the feed screw, M, by means of the driving wheel, K, thereby moving the carriage, N, substantially as herein set forth.

2d, The arrangement of the shaft, D, movable collar, k, wheels, O P and R, in combination with the pitman, m, and walking beam, u, all constructed as described, for the purpose of moving the file handle, S, back and forth, substantially as herein set forth.

3d, The combination of the movable plate, T, carriage, and screw, U, to turn the file at any angle desired, substantially as herein set forth.

4th, The arrangement of the file handle, S, connected with the walking beam, u, and provided with the spring, p, constructed and operating substantially as and for the purposes herein set forth.

5th, The arrangement of the frame, A, clamps, C C, shaft, D, feed screw, M, and carriage, N, all with their different parts constructed as described and operating substantially as and for the purposes herein set forth.

82,048.—BUTTER PAIL.—Henry P. Westcott (assignor to Seneca Falls Churn Manufacturing Company), Seneca Falls, N. Y.

I claim the metallic ear, C, socketed as described, to contain the bar E, in combination with the said bar, and ear, B, with inward projections, as described.

82,049.—SELF-BALANCING CENTRIFUGAL MACHINE.—David M. Weston, Boston, Mass.

I claim, 1st, The application of the easily-yielding spring, e, as the sole suppport of a centrifugal machine revolving upon an upright shaft resting upon a pivot bearing at the base, and in combination with the shaft and pivot bearing, substantially as above described.

2d, The flexible spring, e, in combination with the upright shaft, b, made of sufficient length to prevent the natural oscillation of the machine at an obtuse angle, substantially as described.

3d, The pulley, c, affixed to the shaft, b, below the floor or platform, i, so that the driving power of the machine is wholly applied below the floor.

82,050.—HARVESTER REEL AND RAKE.—Wm. N. Whitely, Springfield, Ohio.

I claim, 1st, The rake head H, with the arms, G G, and with a long tube bearing for the joint bolt, in the manner described, independent of the wooden arm, F.

2d, Attaching the friction roller, N, to the cast rake head, H, by means of a wrought bolt, one end of which forms the journal or bearing of said roller and the other penetrates through said head, and is secured therein by a screw nut, or the equivalent, the reof.

3d, The pendent stud, M, with a tapered socket for the correspondingly shaped bolt, O, which attaches the friction roller to the head, H, as set forth and described.

82,051.—LAMP.—Abel Whitlock, Danbury, Conn.

I claim a lamp pot constructed with the interior chamber, B, said chamber communicating with the reservoir, A, by an orifice, E, which may be closed with a suitable valve while the reservoir is being replenished, in combination with valves, G and I, substantially as shown and set forth.

82,052.—FLOWER POT.—Ephraim Whitman, Fitchburg, Mass.

I claim a flower pot made with inner and outer walls, a b, and an intervening water space, c, the walls, a b, being connected or relatively fixed in position, substantially as shown and described.

Also, in combination with the water chamber, c, the cap ring, i, substantially as shown and described.

82,053.—WINDOW SCREEN.—R. S. Whittier, Dorchester, Mass.

I claim, 1st, The combination and arrangement of the shaft, B, bushings, C and D, disk, F, and spring, E, with the body, A, of the roll, in the manner and for the purpose specified.

2d, The plate, a, provided with a concave bearing, in combination with the square ended shaft, B, and its connections, and with the case, G, for the purpose and substantially as described.

3d, The plate, b, provided with a slot, p, when used in combination with the roll, A, and with the case, G, and the screen, S, for the purpose and substantially as described.

4th, The curved spring plates, d, slotted as shown and described, in combination with the case, G, and the screws, c, or holding devices, which connect the case and the roll with the sash, as described.

5th, The slotted plates, f, constructed as described, in combination with the bar, H, and the screws, e, for the purpose and substantially as described.

6th, The combination with the sash, K, of a case, G, constructed as described, the case serving as a cover and protection to the roll and the screen and also as a device for detaching the bar, H, and the screen from the sill, for the purpose and substantially as described.

7th, The arrangement and combination of the roll, screen, and case, and the supporting plates, with the sash, and the bar, H, with the sill, M, so that the screen shall more perfectly cover the open space produced by raising the sash, as and for the purpose set forth.

8th, The combination of all the operative parts specified, arranged to operate substantially as and for the purpose set forth.

82,054.—SPUR WHEEL.—C. F. Woodruff, Newbern, Tenn.

I claim, 1st, The series of cogs, M, the rim, A, shoulders, m m, and pins, e, constructed and arranged substantially as described.

2d, The spokes, N N, when formed with the trifurcated end, n n', substantially as described.

3d, The combination of the trifurcated spokes, N N, with the projecting ends, R R, of the elongated cogs, substantially as described.

82,055.—MOP.—John A. Wright, Keene, N. H.

I claim a sliding and revolving handle, A, with its projection, c, and screw thread, d, in combination with the jaws, B C, one or both of which are provided with a screw thread, h, substantially as and for the purpose set forth.

Also, a mop cloth sewed substantially as described, to insure the projection, c, catching into and retaining the cloth when it is to be twisted for the purpose of being wrung out.

82,056.—EXERCISING CHAIR.—J. A. Wroe, Hagerstown, Md.

I claim a stationary and exercising chair when the same is constructed with hollow back, seat, arms, and foot board, and is so supported upon pivots or rockers that the chair can be readily operated by means of springs, or their equivalents, substantially as described, as and for the purpose specified.

82,057.—VALVE FOR WATER CLOSETS.—David Morrison, New York city.

I claim, 1st, The plunger, D, valve, J, and hollow spindle, D, with its groove c substantially as shown and described.

2d, The combination of the rod, K, valves, M and N, double valve seat, l, plunger, D, and spindle, E, when arranged and operated substantially in the manner shown and described.

REISSUES.

59,402.—MANUFACTURE OF RUBBER COATED LEATHER.—Dated Nov. 6, 1866; reissue 3,112.—J. J. Fields and A. H. King, New York city, assignees by mesne assignments of Henry W. Joslin.

I claim, 1st, Leather coated with india-rubber or gutta-percha, in the manner substantially as herein set forth.

2d, Applying the rubber to the surface of the leather in a raw state, and etting it congeal on the same, as specified.

65,202.—PROPELLER.—Dated May 28, 1867; reissue 3,113.—F. G. Fowler, Springfield, Ill.

I claim, 1st, The blades, a", constructed, arranged, and operating substantsantially as and for the purposes herein shown and described.

2d, The eccentric, e, with its band, and the rods, e', arranged and operating substantially in the manner and for the purposes set forth.

3d, The removable eccentric, e, applied to steering purposes, and arranged in the manner and for the purpose set forth.

4th, The sleeve, E, chain wheels, r and r", chain, r', and shaft, s, or their equivalents, when used substantially as and for the purpose described.

5th, A propeller constructed of the parts above described, arranged and operating as a combined steering wheel and propeller, substantially as set forth.

20,647.—GANG PLOW.—Dated June 22, 1858; reissue 3,114.—Don Carlos Matteson, Stockton, Cal.

I claim the arrangement as described of the false beam, N, goose neck, G, axle, u, lever, i, catch, L, and the system of plows attached to their frame, as set forth, the whole being constructed and operating substantially as and for the purposes specified.

14,245.—SEALING PRESERVE CANS.—Dated Feb. 12, 1856; reissue 3,115.—S. B. Rowley, Philadelphia, Pa., assignee of R. W. Lewis.

I claim, 1st, A preserve can or jar having a plate intervening between the gum packing, and a cover, or its equivalent, for compressing the packing to its seat on the jar.

2d, The plate or its equivalent, situated below the packing, and filling the throat of the jar, as set forth, for the purpose specified.

3d, Ribs, H, or recesses on the jar, in combination with notches or projections on the plate above the packing, for the purpose specified.

EXTENSIONS.

MOLDS FOR CEMENT OR EARTHEN TUBES.—Bradford S. Pierce, and Charles M. Pierce, of New Bedford, Mass.—Letters Patent No. 11,440, dated August 1, 1854.

We claim the combination of a core and spring case, substantially as herein set forth.

CULTIVATOR.—Daniel W. Shares, Hamden, Conn.—Letters Patent No. 11,460, dated August 1, 1854.

I claim providing the expanding and contracting hoeing wings B, on either side with cultivator teeth, C, projecting downward on the inside of the hoeing wings or scrapers, as and for the purposes specified.

PLOWS.—Joshua Gibbs, Canton, Ohio.—Letters Patent No. 11,523, dated August 15, 1854.

I claim making the working surface of the mold board in the form of a section of the interior surface of a hollow cylinder, the center or axis of said cylinder being parallel, or nearly parallel, horizontally to the base of the mold board or bottom of the plow substantially as described.

MACHINE FOR PLANING LUMBER OUT OF WIND.—Solomon S. Gray, Boston, Mass. Letters Patent No. 11,582, dated August 22, 1854; reissue No 945, dated April 17, 1860.

I claim, 1st, The peculiar construction of cutter head herein described, the cutter head itself being made use of to turn and break the shaving, in the manner of a double iron plane, and being furthermore made concave for the purpose of facilitating this operation.

2d, The clamp, as herein described, for the purpose of dogging the lumber to the bed of the machine, the body of the clamp being pivoted at d, and forced up by the screw, F, or its equivalent, the dog, n, being adjustable therein, in the manner and for the purpose set forth.

3d, The within described method of securing the dog, M, to the bed of the machine by means af the teeth or cogs, l, and the mortises in the side pieces m, for the purposes set forth.

4th, I claim the bar, D, or its equivalent, in combination with a rotary cutter head and traveling bed, I, provided with suitable dogs for planing straight and out of wind, substantially as set forth.

SEWING MACHINE.—Sidney S. Turner, Westboro, Mass. Letters Patent No, 11,588, dated August 22, 1854; reissue No. 363, dated March 25, 1856; again reissued No. 1,962, dated May 16, 1865.

I claim the combination, in a sewing machine, of an automatic feed, a work supporting surface, and a needle, when the needle is arranged to operate from below the table or work supporting surface, and without the cooperation of a second thread (or a device carrying a second thread) above the table or work supporting surface.

Also the combination together, of a needle and awl, when the same enter the work in opposite directions, and each withdraws in a direction opposite that from which it entered.

Also, the combination, in a sewing mechanism, of an automatic needle turner and automatic feed, by which the loop is kept in proper position with respect to the needle as the work progresses.

Also, the method of effecting the rotation of the hook, substantially as specified.

CARDING MACHINE.—Horatio N. Gambrill, of Baltimore, Md., and Thomas D. Bond, of Washington, D. C., administrator of Singleton F. Burgee, deceased.—Letters Patent No. 12,469, dated February 27, 1855; antedated August 22 1854; reissue No. 509, dated November 17, 1857.

We claim the application of two or more sets or pairs of feeding rollers to the working cylinder of carding engines, substantially in the manner and for the purpose set forth, and this we claim whether said feed rollers deliver the material directly on to the main cylinder or to lickers-in, when said lickers-in are so arranged as to work in connection with each other and with the main cylinder, for the purpose and in the manner substantially as set forth.

We also claim the reversing of the relative velocities of the peripheries of the main working cylinder and stripper, M, at intervals, by an automatic movement for the purpose of cleaning or preventing the clogging of the main cylinder, substantially as described.

MACHINE FOR GRADUATING CARPENTERS' SQUARES.—Norman Millington, of Shaftesbury, Vt., and L. J. Martison, S. M. George, and A. B. Gardner, of the same place, executors of Dennis J. George, deceased. Letters Patent No. 11,489, dated August 8, 1854.

We claim, 1st, The arrangement in a single frame, substantially as set forth, of as many gravers as there are units to be divided, so as, by the action of the cam wheel, W, or its equivalent, simultaneously to trace, of the proper length, each set of division and fractional lines.

2d, The balance frame, V, with its appendages, to equalize the pressure of the spiral springs on the graver handles, g, so as to give the same depth of mark on the thin as well as the thick end of the taper square.

3d, The inclined plane, i, with its appendages for moving the square longitudinally, and dividing the inch into any desirable number of . . . . equal parts.

4th, The carriage, C, arranged to press the square up against the points of the gravers by a cam, or otherwise, all of the several parts, or their equivalents to be arranged and combined as above specified, or in any other manner substantially the same which shall produce the intended effect.

CENTRIFUGAL PUMP.—William O. Andrews, New York city. Letters Patent No. 11,544, dated August 22, 1854.

I claim the construction of the pump as herein described and shown, viz., having a tub, E, in the shape of the base of a cone inverted, with arms, a, attached to its periphery, of a gradually-decreasing width as they approach its base, placed within a shell corresponding in shape to the outer circumference of the arms, and having induction passages or a spiral form, gradually decreasing in pitch to their point of delivery, and eduction passages of a spiral form, of a gradually-increasing pitch until they attain a straight line, by which construction the water is made to pass, without sudden change of direction or eddies, in an unbroken volume through the pump; and I do not limit myself to the precise mechanical construction as shown, but may modify the different parts, only retaining the same general combination.

MACHINE FOR CASTING METALLIC EYES OR MAILS OF HEDDLES FOR LOOMS.—Jacob Senneff, of Philadelphia, Pa. Letters Patent No. 11,589, dated August 22, 1854.

I claim, 1st, The method, within described, of casting the eyes or mails on the strands of yarn or other material, by inserting the yarns successively within a mold secured on a vibrating frame, L, operated at the proper intervals of time by means of the eccentric cam, I I, said cams being opened at times to disengage the mail therefrom, and provided with a core, 24, for forming the eye in the mail, and capable of being withdrawn therefrom before the mold opens, substantially in the manner and for the purpose herein set forth.

2d, The manner of operating the core, so as to enable it to be so withdrawn from the eye of the mail after the same is formed, and while it is firmly embraced within the mold, by means of the spring, S, and screws, 25 and 33, operating in the manner described.

3d, The core carrier, 27, resting in a notch formed in the top of the spring, S, and having pins, 26, on its face, which pass through slots in the mold plates and spring, W, for moving the core horizontally from the stationary half of the mold, and keeping it midway between the mold plates, when they are opened by the lever, T, and preventing it being thrown violently either way, as herein set forth.

4th, The manner of operating the heddle frame holder, D, by means of the eccentric cams, I, on the shaft, B, capable of being moved longitudinally over the grooves in said shaft, right-angled levers D, to which the heddle-frame is secured, and spiral springs, 21, for keeping the ends of the levers always in contact with the eccentric cams; and, in combination therewith, I claim the screw shaft, V, and clamps, J, and the adjustable gearing, K, at the ends of the screw and main driving shafts, the whole being constructed and operating in the manner and for the purpose herein fully set forth.

PACKING FOR STUFFING BOXES, ETC.—Jos. H. Tuck, Broklyn, N. Y.—Letters Patent No. 13,145, dated June 26 1855; patented in England, August 25, 1854.

I claim the forming of packing for pistons or stuffing boxes of steam engines, and for like purposes, out of saturated canvas, so cut as that the thread or warp shall run in a diagonal direction from the line or center of the roll of packing, and rolled into form either in connection with the india-rubber core or other elastic material, or without, as herein set forth.

GOVERNOR OF WINDMILLS.—Daniel Halladay, Batavia, Ill.—Letters Patent No. 11,629, dated August 9, 1854.

I claim attaching the spindles, b, of the wings or sails, F, to a sliding head, G, by means of the levers, f h, or their equivalents, and operating said head, G, by means of the lever, H, or its equivalent, and a governor of any proper construction, for the purpose of giving the desired obliquity to the wings or sails, and thereby insuring an equal motion and power during the variable velocity of the wind.

LEATHER-SPLITTING MACHINE.—Sarah W. Flanders, Newburyport, Mass., administratrix of Joseph F. Flanders, deceased, and Jeremiah A. Marden, Boston, Mass.—Letters Patent No. 11,604, dated August 29, 1854.

We claim the use of the continuously revolving or endless belt knife, as applied to machines for splitting leather, and operating in the manner substantially as set forth.

MANUFACTURE OF INDIA-RUBBER.—Caleb Swan, Easton, Mass., executor of Daniel Hayward, deceased.—Letters Patent No. 11,608, dated August 29, 1854.

I claim the improvement in the process of vulcanizing native india-rubber, or rubber once vulcanized compounded with other articles, as above set forth, which consists in heating and curing them with steam, and under pressure, and in regulating the application of steam, and the induration of the product by the introduction of steam and water, as described, by which a very great saving is made in the time and fuel required for the process, as hereinabove stated.

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

2,395.—FLAME SPREADER AND AERATOR FOR GAS AND OTHER BURNERS.—Joseph S. Machir, Washington, D. C. July 30, 1868.

2,396.—DISTILLATION, AND MEANS AND APPARATUS EMPLOYED THEREIN.—Thos. Prosser, New York city. July 30, 1868.

2,400.—MANUFACTURE OF AND REPAIRING RAILWAY RAILS.—Hugh Baines, Toronto, Canada. July 30, 1868.

2,404.—SUBSTITUTE FOR INDIA RUBBER.—A. G. Day, Seymour, Conn. July 31, 1868.

2,422.—MACHINERY FOR MANUFACTURING METALLIC EYELETS.—Wm. R. Landfear, Hartford, Conn. Aug. 1, 1868.

2,465.—FELTED FABRICS.—Henry Hayward, New York city. Aug. 6, 1868.

2,473.—SEWING MACHINE.—Benj. P. Howe, New York city. Aug. 7, 1868.

1,821.—DECORATING WALLS, ETC.—Wm. Howell, Philadelphia, Pa. June 3, 1868.

2,444.—HARVESTING MACHINE.—George Harding, Philadelphia, Pa. Aug. 4, 1868.

2,448.—BOOT AND SHOE SEWING MACHINE.—Michael J. Stein, New York city. Aug. 4, 1868.

2,453.—MANUFACTURE OF IRON AND STEEL.—Lorenzo Sibert, Mount Solon; D. C. E. Brady, Buffalo Forge; and John D. Imboden and Seth M. Barton, Richmond, Va. Aug. 5, 1868.

2,458.—INDICATOR AND SAFETY VALVE FOR STEAM BOILERS.—Chas. Bailey, Cincinnati, Ohio. Aug 6, 1868.

2,466.—BOOTS AND SHOES.—John M. Hunter, Morristown, N. J. Aug. 6, 1868.

2,471.—INDIA RUBBER FABRIC.—John Haskins, Boston, Mass. Aug 7, 1868.

2,478.—FIRE-ARM.—Wm. Gardner, Toledo, Ohio. Aug. 7, 1868.

2,485.—STEAM ENGINE GOVERNOR.—Edwin L. Bomeisler, Philadelphia, Pa. Aug 8, 1868.

2,486.—SCREW AND SCREWDRIVER.—Peter N. Jacobus, Flatbrookville, N. J. Aug. 8, 1868.

PATENTS.

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U. S PATENT OFFICE, WASHINGTON. D. C., Sept. 7, 1868.

B. F. Brown, Dorchester, Mass., having petitioned for an extension of the patent granted him on the 12th day of December 1854, for an improvement in "Hanging Carriage Bodies."

It is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Sept. 9, 1868.

Sylvanus Sawyer, of Fitchburg, Mass., having petitioned for an extension of the patent granted him on the 12th day of December, 1854, for an improvement in "Rattan Machine," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed at this office twenty days before the day of hearing.

13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, Washington, D. C., Sept., 9th, 1868.

James E. Simpson, of Brooklyn, N. Y., having petitioned for an extension of a patent granted him on the 5th day of December, 1854, for an improvement in "Dry Docks," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, Washington, D. C., Sept. 9, 1868.

Charles Danforth, of Paterson, N. J., having petitioned for the extension of a patent granted him on the 12th day of December, 854, for an improvement in "Throstles for Spinning Cotton," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., August 27, 1868.

Emeline M. Woodruff (late Emeline M. Stedman), of Elizabeth, N. J., executrix of the estate of Geo. W. Stedman, deceased, having petitioned for an extension of the patent granted to said Geo. W. Stedman the 12th day of December, 1854, and reissued the 26th day of April, 1859, for an improvement in "Sewing Machines," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON. D. C., Sept. 2, 1868.

Birdsill Holly, of Lockport, N. Y., having petitioned for an extension of the patent granted to him on the 6th day of February, 1855, for an improvement in "Elliptical Rotary Pumps," it is ordered that said petition be heard at this office on the 11th day of January next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 28, 1868.

Aaron H. Allen, of Boston Mass., having petitioned for an extension of the patent granted to him on the 5th day of December, 18—, for an improvement in "Seats for Public Buildings," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., August 31, 1868.

Jeremiah Stever, Bristol Conn., having petitioned for an extension of the patent granted him on the 12th day of December, 1854, for an improvement in "Machines for Scraping Metals," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 28, 1868.

John Pepper, of Gilford, N. H., having petitioned for an extension of the patent granted to him on the 5th day of December, 1854, and reissued on the 27th day of October, 1868, for an improvement in "Circular Knitting Machines," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, Washington, D. C., Sept 4th, 1868.

Samuel N. Miller, of Dedham, Mass., having petitioned for the extension of the patent granted him on the 29th day of June, 1852, for an improvement in "Combined Anchor," this application having been authorized by Act of Congress, approved July 20, 1868, it is ordered that said petition be heard at this office on the 23d day of November next

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, Washington. D. C., Sept. 1st, 1868.

Cyrenus Wheeler, Jr., of Auburn, N. Y., having petitioned for the extension of a patent granted him on the 5th day of December, 1854: reissued Jan. 3, 1860, in seven divisions, numbered 875, 876, 877, 878, 879, 880, 881, and reissue numbered 876, again reissued May 14, 1867, and numbered 2,610, for an improvement in "Grain and Grass Harvesters," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, Washington, D. C., Sept. 1st, 1868.

Cyrenus Wheeler, Jr., of Auburn, N. Y., having petitioned for the extension of a patent granted him the 6th day of Feb 1855; reissued June 5, 1860, numbered 971, and again reissued May 28, 1867, and numbered 2,632, for an improvement in "Grain and Grass Harvesters," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug 22, 1868.

James H. Whitney, of Brooklyn, N. Y., administrator of the estate of Theodore E. Weed, deceased, having petitioned for an extension of the patent granted the said Theodore E. Weed on the 28th day of November, 1854, for an improvement in "Sewing Machines," it is ordered that the said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 21, 1868.

Whitten E. Kidd, of New York city, having petitioned for an extension of the patent granted him on the 28th day of November, 1854, and reissued the 13th day of January, 1857, for an improvement in "Molds for Pressing Bonnet Fronts," it is ordered that the said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE WASHINGTON, D. C., Aug. 3, 1868.

Daniel G. Ambler and Halsted H. Hoeg, of Jacksonville, Fla., administrators of the estate of Daniel C. Ambler, deceased, having petitioned for an extension of the patent granted to the said Daniel C. Ambler on the 7th day of November, 1854, for an improvement in "Sewing Machines," it is ordered that said petition be heard at this office on the 2d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE. WASHINGTON, D. C., Aug. 21, 1868.

T. J. W. Robertson, of Washington, D. C., having petitioned for an extension of the patent granted him on the 28th day of November, 1854, for an improvement in "Sewing Machines," it is ordered that the said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

11 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 15, 1868.

Charles Parham, of Philadelphia, Pa., having petitioned for an extension of the patent granted him on the 21st day of November, 1854, and reissued on the 3d day of November, 1863, for an improvement in "Sewing Machines," it is ordered that said petition be heard at this office on the 2d day of November, next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 20, 1868.

George W. Lee, of Winchester, Ohio, having petitioned for an extension of the patent granted him on the 21st day of November, 1854, for an improvement in "Seed Planters," it is ordered that said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 12, 1868.

Eliza Mascher, of Philadelphia, Pa., administratrix of the estate of John F. Mascher, deceased, having petitioned for an extension of the patent granted the said John F. Mascher the 8th day of March, 1853, for an improvement in "Daguerreotype Cases" (this application having been authorized by act of Congress, approved July 27, 1868), it is ordered that the said petition be heard at this office on the 2d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

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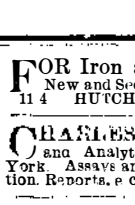

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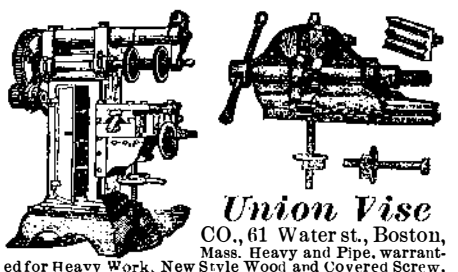

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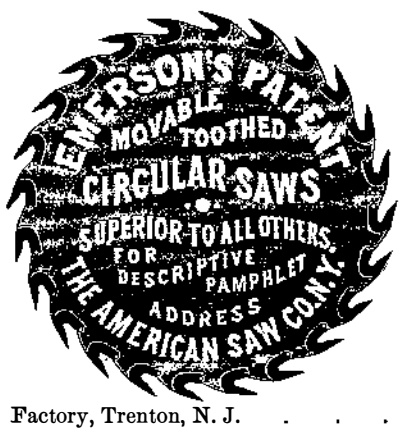

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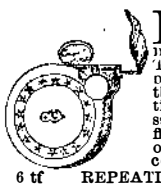
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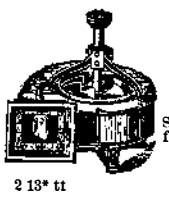
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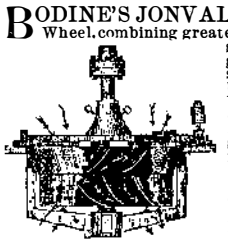
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